PROJECT REPORT

A LONG-RANGE SOLID WASTE MANAGEMENT PROGRAM

OAKLAND SCAVENGER COMPANY

JUNE 1975

OAKLAND SCAVENGER COMPANY

The Oakland Scavenger Company, employing more than 650 people, is one of the largest privately owned solid waste collection and disposal companies in the United States. The Company serves approximately 75 percent of the Alameda County population through franchised agreements in Albany, Emeryville, Piedmont, Oakland, Hayward, Fremont, Newark, Union City, and Livermore. In addition, Oakland Scavenger Company provides service through contracts with the Castro Valley Sanitary District, serving Castro Valley, the Oro Lomo Sanitary District serving San Lorenzo, Ashland, and portions of San Leandro, and Valley Community Services District serving Dublin and San Ramon, a community in Contra Costa County. This service area includes almost 900,000 people in 300,000 homes, businesses, and industries.

More than 600,000 tons of the 1.1 million tons solid waste generated annually in Alameda County are brought to the Company-owned landfills: the Davis Street disposal site in San Leandro and the Fremont disposal site on Durham Road. The Company collects approximately 450,000 tons of this waste along their routes with a fleet of 250 collection trucks. The remaining portion is hauled to the sites by private contractors, other licensed rubbish haulers, and the public.

In looking ahead to future solid waste needs, the Company has been conducting studies to keep abreast of planning requirements. A recent series of surveys and analyses were carried out to determine future facility and equipment requirements to the year 2000 and beyond, and to accurately establish the actual potential for material and energy recovery. These studies have formed the basis for the Company's proposed solid waste management program.

Oakland Scavenger Company is closely involved in other related solid waste disposal activities. A subsidiary of the Company, Bay Cities Paper Stock Company, operates an active paper recycling program that recovers more than 40,000 tons of waste paper stock annually. The Company also handles commercial canning waste in the summer season and manufactures its own drop box containers.

PROJECT REPORT

FOR

A LONG-RANGE SOLID WASTE MANAGEMENT PROGRAM

Proposed by the

Oakland Scavenger Company

June 1975

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INTRODUCTION

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INTRODUCTION

The East Bay communities in Alameda County are faced with a critical shortage of municipal solid waste disposal facilities. Only 3 of the 11 landfill sites that were operating in 1970 will be open after 1980. Already, 3 sites have closed and, within the next two years, 4 more landfills along the Bay front will discontinue operations. Another site will be completed in 1980. Some sites have closed in response to a growing concern for preserving San Francisco Bay. Others are rapidly nearing their capacity.

While landfills are closing, municipal solid waste production is increasing. At the present time, an average of 5.1 pounds per capita of solid waste are produced every day. At this rate, more than 1 million tons a year of refuse are generated in Alameda County. With population continually increasing, and the solid waste generation rate rising to 6.5 pounds per capita in the year 2000, an estimated 1.5 million people in the county are expected to produce over 1.7 million tons of solid waste annually at that time.

Recognizing the need for new approaches to solid waste management in Alameda County in the coming decades, the Oakland Scavenger Company, which serves more than 75 percent of the county with collection and disposal services, has embarked upon a program to cope with the problems in the immediate future, and beyond the year 2000. This report describes the Company's proposed long-range program for handling and disposing of municipal and industrial solid wastes.

The solid wastes to be handled in the project include municipal and industrial wastes from a population of nearly 800,000. Municipal solid waste includes the refues and rubbish that is produced in residential and commercial establishments, as well as the refuse from demolition and construction activities. Industrial wastes include food processing residues and solids from manufacturing processes. Other major types of solid wastes such as agricultural, hazardous, and other special wastes are not part of this project. They generally require special treatment and separate disposal methods.

The proposed program focuses on resource recovery, transfer, and ultimate disposal. While energy recovery has been included in the planning of the program, it is not part of the specific proposal. The processing, transfer, and disposal facilities included in the program must be constructed first to meet the immediate solid waste problems. In recent years, technology has developed various ways of processing solid waste to recover material resources and energy. Most of these processes, especially those dealing with energy recovery, are still in the testing and demonstration stage. Even though these innovations

herald a new era in solid waste management, the traditional method of landfilling is still necessary as a major element in waste disposal. Many factors -- the environment, mechanical recovery systems capabilities, the percentage of recoverable materials in the waste stream, public health and safety considerations, as well as the availability and proximity of markets for recovered materials -- determine the system most effective for reliable economical waste management.

In formulating the proposed program, a major aim has been to devise a way to manage solid waste to protect public health and the environment and, at the same time, to conserve resources through the development of resource recovery processes. This objective responds to recent legislative actions. In 1972, the State of California created the State Solid Waste Management Board. Broad principles and objectives for managing solid waste were contained in state policy adopted by the Board in December 1974. At the same time, the Board adopted the State Solid Waste Resource Recovery Program containing more specific approaches for increasing material and energy recovery throughout the state.

In accordance with legislative requirements a 23-member Solid Waste Management Plan Advisory Committee and a 20-member Technical Advisory Committee have been formed by the Alameda County Board of Supervisors. These groups are reviewing background studies and alternative plans preliminary to the preparation of the County Solid Waste Management Plan. This plan is being prepared in accordance with provisions of the Solid Waste Management and Resource Recovery Act of 1972, which requires all counties in the state to submit comprehensive coordinated solid waste management plans to the State Solid Waste Management Board by January 1, 1976. As part of their work, these committees will be reviewing the proposed solid waste management program prepared by the Oakland Scavenger Company.

This report is a description of the Oakland Scavenger Company proposed program. It accompanies applications for the project and is being distributed to Alameda County and all jurisdictions within the county and to Federal, State, regional and local agencies, as well as special districts for information and review. It is also available to residents of Alameda County in order that they may understand the acute solid waste management problems and assess the alternatives and proposed solutions.

The program is being managed by the Solid Waste Management Division of the Company. The consultant engaged by the Company to assist in developing the program and to design and administer construction of the facilities is Bissell & Karn, Inc., Civil Engineers. Woodward-Clyde Consultants is the soil and geological consultant for the program. Those engaged to evaluate environmental factors and to contribute to the necessary environmental impact reports include: John J. Forristal, Traffic Consultant; Dr. Philip Leitner, Biological Consultant; Dr. David A. Fredrickson, Archaeological Consultant; Dr. Albert Miller, Meteorological Consultant; Buonoaccursi & Associates, Acoustical Consultants.

SUMMARY

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SUMMARY OF THE PROPOSED PROGRAM

The Solid Waste Management Program proposed by the Oakland Scavenger Company is an integrated system designed to replace the landfills in the East Bay that have recently closed and those that are scheduled to close, and to introduce resource recovery into solid waste management in Alameda County. It will be a flexible system adaptable to new technology in solid waste handling, particularly in materials and energy recovery. The elements of this system are:

San Leandro Resource Recovery/Transfer Station - This facility will be located at the foot of Davis Street on the site of the landfill that is being phased out of operation over the next one-and-a-half years. Initially, the facility is expected to handle 3100 tons of refuse a day from a population of nearly 300,000 in 11 East Bay communities. Ultimately, it will be capable of expanding to 4200 tons a day peak capacity by the year 2000. A truck maintenance facility for service and maintenance of transfer trucks will be included.

Altamont Sanitary Landfill - A new sanitary landfill will be located on 1600 acres of property in the Altamont Hills in the eastern part of Alameda County. At the rates of solid waste generation presently projected, this site will serve for at least 50 years, and longer with resource recovery processes in operation.

Transfer Vehicles - A fleet of high-capacity long-haul truck and trailer units will be used to haul waste from the San Leandro facility approximately 33 miles to the sanitary landfill site.

Material Recovery - Equipment at the San Leandro facility will be installed after the transfer operations begin. Initially ferrous metals will be recovered and, later, nonferrous metals such as aluminum, copper, brass, and zinc, as well as glass could be extracted.

Hayward Area Resource Recovery/Transfer Station - a second facility, if required, could be located in the Hayward area after the San Leandro facility has begun operations. Equipment could be installed to recover ferrous metals. Residuals would be transferred to the San Leandro facility for further processing to extract nonferrous metals and glass.

Future Energy Recovery - The site plan and design of the San Leandro facility includes provisions for future development of an energy recovery facility.

Estimated Cost - The total cost for this proposed program is estimated at $14.3 million. Of this total, an estimated $7 million would be required initially for the San Leandro resource recovery/transfer facility, the transfer vehicles, and the Altamont sanitary landfill. The remaining $7.3 million would be invested in materials recovery and the Hayward Area facility. Construction of an energy recovery facility could cost approximately $45 million and is not included in these estimates.

Communities to be Served By New Facilities - The San Leandro facility will be capable of handling all the waste from the 11 East Bay communities using landfills that will be closed by 1980. These communities include: Albany, Berkeley, Emeryville, Oakland, Piedmont, Alameda, San Leandro, Hayward, San Lorenzo, Ashland, and Castro Valley. If the City of Berkeley adopts another disposal solution, the system will still be feasible.

Continuing Service - The Cities of Fremont, Newark, and Union City will continue to receive collection services, including disposal at the Durham Road disposal site, from the Oakland Scavenger Company under existing agreements. Collection service will also continue to the City of Livermore. In addition, the communities of Dublin and San Ramon will be served under existing service agreements with Valley Community Services District (VCSD).

Potential for Expansion - The program has the flexibility to expand to serve all the communities in Alameda County by adding other transfer facilities. Adequate capacity exists at the landfill to provide for disposal from other communities.

Development Schedule - To respond to the critical solid waste management situation facing the East Bay communities, plans call for the San Leandro transfer operations, the Altamont landfill, and the transfer vehicles and truck maintenance facilities to be ready for operation by early 1977. Once this system is operating, detailed engineering design work for resource recovery facilities can be finalized.

BACKGROUND FOR PLANNING

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BACKGROUND FOR PLANNING

Today solid waste management in Alameda County is a multi-million dollar industry undergoing rapid transition. In recent years, intense awareness of the immensity and importance of the solid waste disposal problem has developed. This concern is reflected in recent environmental, technical, and legislative activity directed at solid waste disposal.

THE AREA

Alameda County, one of the nine San Francisco Bay Area counties, covers 735 square miles of land. A rapidly growing county with 13 cities, it is located on the eastern edge of San Francisco Bay, as shown in Figure 1. Across the Bay to the west lie San Francisco, the Golden Gate Bridge, and the Pacific Ocean. Geographically, the county is divided into two parts by the East Bay Hills. On the western side is a 36-mile-long plain along the Bay. This plain varies in width from 3 miles in the north to 12 miles in the south. East of the hills lies an extensive system of valleys including the Livermore-Amador Valley, a bowl-shaped area surrounded by the gently rolling hills of the Diablo Range. Elevations range from sea level along the Bay to 3807 feet in the mountainous area in the southeast. Several geologic features and various soil types are represented. Vegetation varies from coastal salt marsh to green forestation and a variety of grasses.

PLANNING UNITS

To aid in carrying out planning functions, the Alameda County Planning Department has designated four planning units in Alameda County. These units -- Central Metropolitan, Eden, Washington, and Livermore-Amador Valley -- are delineated in Figure 2 which also indicates populated urban areas. Planning unit boundaries and data coincide closely with the Oakland Scavenger Company's operations and program, and have been used here to facilitate an understanding of the broad application of the Company's program. The Central Metropolitan and Eden Planning Units contain a population of approximately 870,000. These are the units where all of the landfills serving this area of the county will be closed by 1980. Ten communities in these units will require new solid waste disposal facilities within 18 months.

POPULATION

Until the 1950's, the major population growth and urbanization in Alameda County occurred in the northern cities along the Bay plain, primarily in Oakland, Berkeley, Albany, and Emeryville. During the last 25 years, a

LOCATION MAP

FIGURE 1

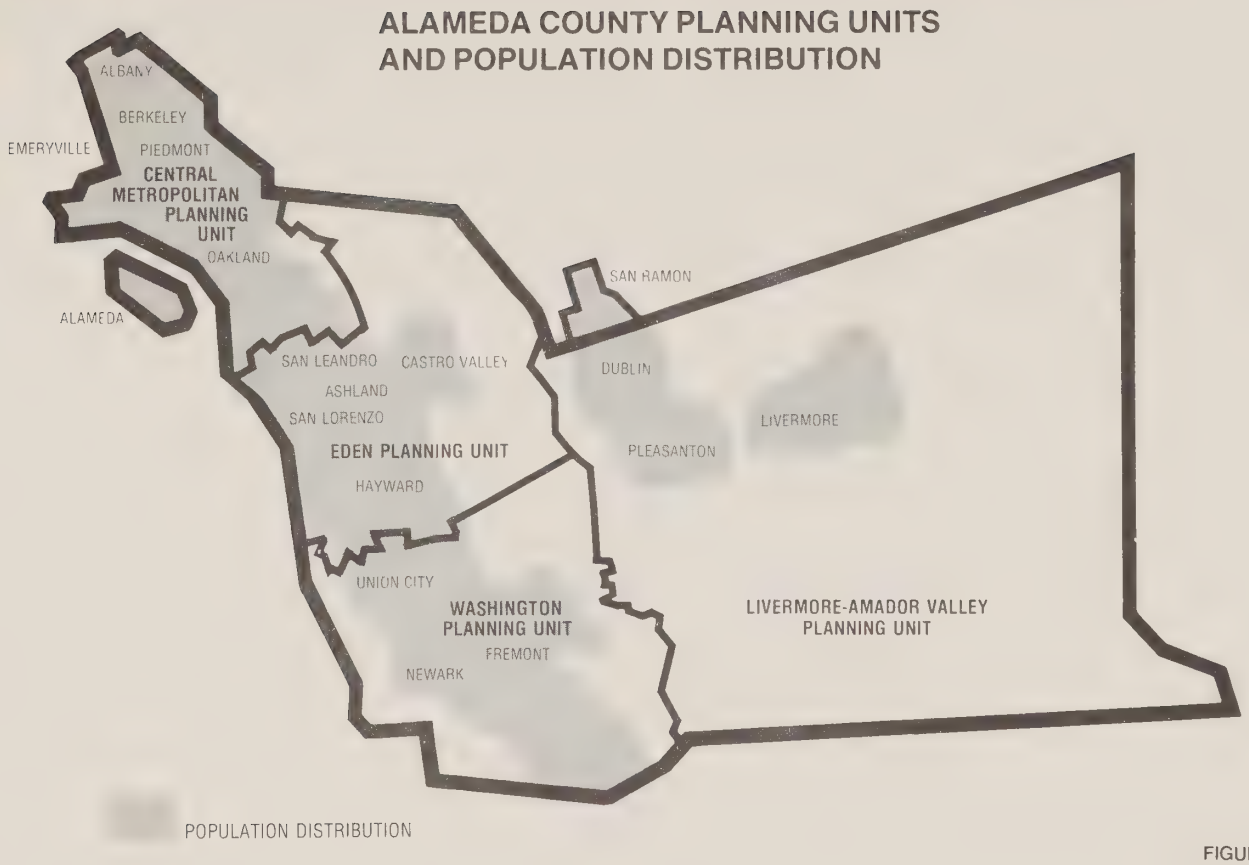


FIGURE 2

major portion of Bay Area population growth has concentrated in southern Alameda County. The Cities of Hayward, and San Leandro, Union City, Newark, and Fremont, as well as the unincorporated communities of San Lorenzo, and Castro Valley have absorbed much of this new development. The population has also rapidly increased in the Livermore-Amador Valley, particularly in and around the Cities of Livermore and Pleasanton, and the community of Dublin. While Oakland remains the County's major population center, like many metropolitan centers, it has experienced a slight decline since the 1970 Census as some population has shifted to the suburbs. The shaded parts of Figure 2 show the Bay plain and valley areas where major portions of the population are distributed in the county.

The 1970 Census, as revised in 1973, recorded the population of Alameda County at 1,071,446. This population represented an increase of more than 331,000 over the 1950 Census figure of 740,315 and more than 163,000 over the 1960 population of 908,309. The population is heavily concentrated in the Central Metropolitan and Eden Planning Units which together accounted for 80 percent of the population in 1970.

Population Projections

Population projections estimating high, moderate, and low growth in Alameda County have been prepared at the state, regional, and county levels. These projections, as shown in Table 1 and Figure 3, are the growth rates developed by the California State Department of Finance in 1972, the Association of Bay Area Governments (ABAG) in 1973, and the Alameda County Planning Department in 1973. The County projections were subsequently modified by Cal Trans and the Planning Department in 1974.

Both of the County's projections, the "A" series and the "B" series, correlate closely to the moderate growth rate projections made by the State Department of Finance and ABAG. The "A" series represents a continuation of past trends in the county and county planning units as revealed in the 1970 Census data, and adopts birth and death statistics developed by the County Health Care Services Agency. The "B" series is a modification of the trends, except for births and deaths, and reflects various influences to stabilize population and, in certain areas, to control growth. For planning purposes, the County has adopted the "B" series with a growth rate of 1.2 percent per year from 1970 to 1980 and 1.1 percent from 1980 to 1990.

TABLE 1

POPULATION PROJECTIONS BY PLANNING UNIT - ALAMEDA COUNTY

PLANNING UNIT	1970[1]	1973[2]	1975[2]	1980[2]	1990[2]	2000[3]
Central Metropolitan	575,799	583,000	585,000	592,000	601,000	610,000
Eden	274,787	283,000	285,000	296,000	312,000	329,000
Washington	143,225	182,000	190,000	206,000	267,000	328,000
Livermore-Amador	77,655	100,000	104,000	121,000	158,000	195,000
County Total	1,071,446	1,148,000	1,164,000	1,215,000	1,338,000	1,461,000

1. U. S. Bureau of the Census, April 1970, as revised April 1973.
2. Alameda County Planning Staff and Alternatives Subcommittee of the Alameda County Solid Waste Management Plan Technical Advisory Committee. Solid Waste Management Alternatives for Alameda County. Draft. November 1974. p. 56.
   1975, 1980, and 1990 are basically the "B" series projections by Alameda County Planning Department, December 1972. The populations given for the Livermore-Amador Valley Planning Unit include the projected population in the portion of San Ramon that received service from Oakland Scavenger Company. The figures for the Central Metropolitan Planning Area incorporate projections for Berkeley and the City of Alameda that were made in April, 1974 by CalTrans and Alameda Planning Department in connection with the Corridor Study.
3. Oakland Scavenger Company.

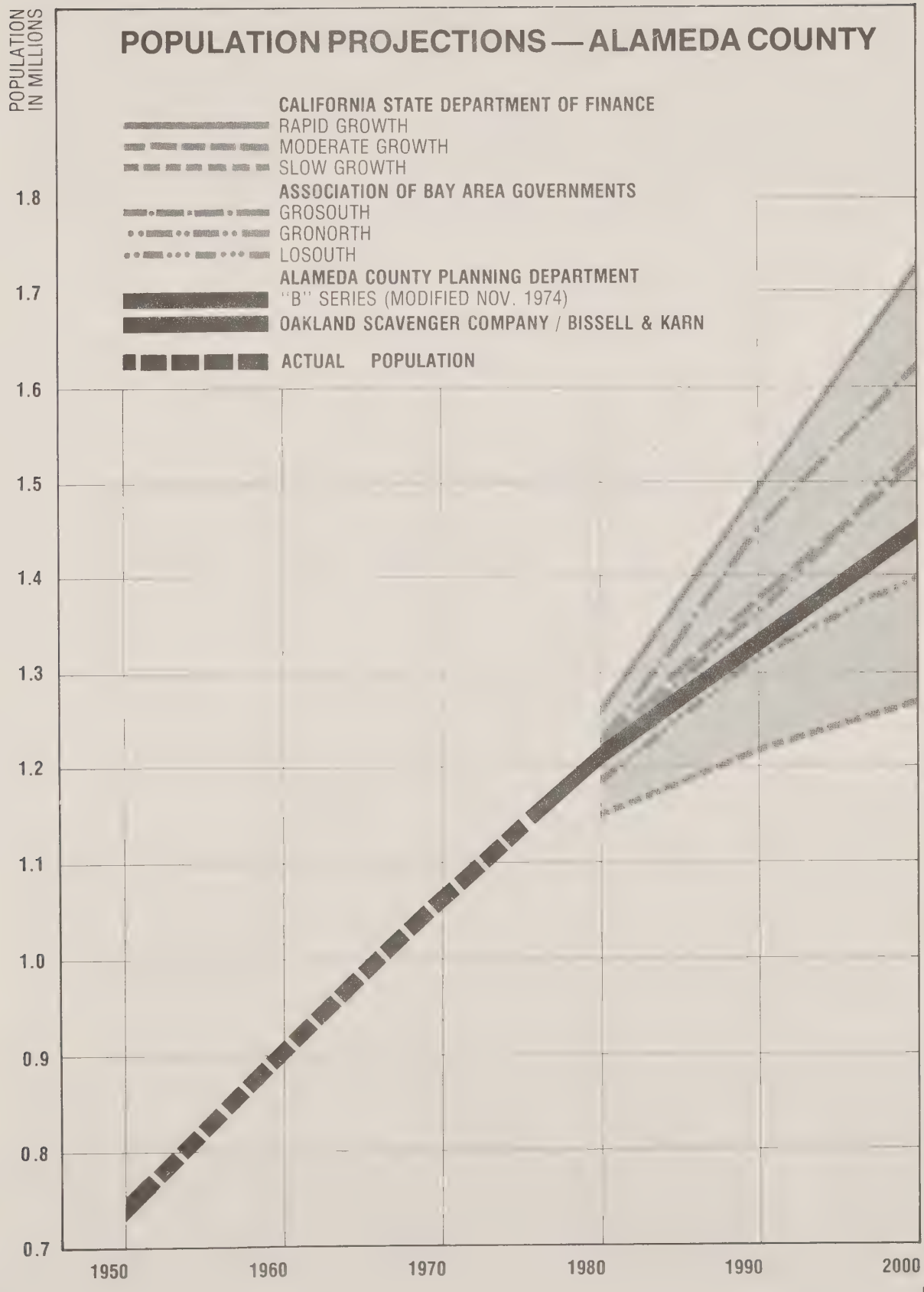

POPULATION PROJECTIONS — ALAMEDA COUNTY
POPULATION IN MILLIONS
CALIFORNIA STATE DEPARTMENT OF FINANCE
RAPID GROWTH
MODERATE GROWTH
SLOW GROWTH
ASSOCIATION OF BAY AREA GOVERNMENTS
GROSOUTH
GRONORTH
LOSOUTH
ALAMEDA COUNTY PLANNING DEPARTMENT
"B" SERIES (MODIFIED NOV. 1974)
OAKLAND SCAVENGER COMPANY / BISSELL & KARN
ACTUAL POPULATION
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
1950
1960
1970
1980
1990
2000

FIGURE 3

In preparing the proposed program, the Oakland Scavenger Company has used the County's modified "B" series for 1980 and 1990 and developed projections from 1990 to 2000 on the basis of a 1.1 percent growth rate. Oakland Scavenger Company recognized that there are competing pressures for growth control and continued development in Alameda County. As shown in Table 1 and Figure 3, the County's modified "B" series and the Oakland Scavenger Company projections are mid-range forecasts which reflect these competing pressures. As estimates which are lower than the moderate growth rates projected by both the California State Department of Finance and ABAG, they are also conservative forecasts of population growth in the county.

SOLID WASTE

Definitions

The solid wastes that are the focus of this report are municipal wastes, and the food processing and manufacturing residues that are commonly considered industrial wastes. They will be referred to in this report as municipal/industrial solid wastes.

Generally, municipal solid wastes include residential refuse and rubbish, commercial wastes from markets, restaurants, stores, office buildings, and transportation terminals. Industrial solid wastes come from lumber, manufacturing, food processing, and petroleum industries. In Alameda County, most of the industrial solid waste is produced by four major industries: 1) primary metal working or smelting, 2) stone, clay, glass, and concrete products, 3) machinery manufacturing, and 4) transportation equipment manufacturing.

Wastes that are not included in this project are agricultural, hazardous, special wastes and construction and demolition debris. These residues usually are disposed of through special handling or direct haul to the sanitary landfill. Agricultural solid wastes are produced by livestock feed lots and by vegetable and fruit-growing operations as well as from the production of cut flowers and nursery plants. Agricultural wastes are not a large problem in Alameda County. Most agricultural production is confined to the Washington and Livermore-Amador Valley Planning Units and the wastes are biodegradeable and disposed of at, or near, the point of origin.

Hazardous and special wastes include liquid industrial solutions such as chemicals and also slurries, sludges, radioactive, and contaminated materials. Other wastes requiring special care in handling and disposal include medical clinic and hospital wastes, and sewage sludge. Medical facilities use increasing amounts of disposable items including sheets, gowns, and other linens, even utensils, partly to reduce the threats of incomplete sterilization. These contaminated items are added to other common medical wastes - sharp needles, pathological and surgical remains, non-combustibles, ashes and residues, and radiological refuse.

Sewage sludge is recognized as a special waste problem. In California, as the Regional Water Quality Control Boards and Environmental Protection Agency (EPA) regulate improved water quality requirements, the generation of sludge is expected to increase. Solutions to disposal of this sludge are being independently pursued by the affected sewage treatment agencies. The proposed Altamont sanitary landfill site will be capable of handling this waste, with emphasis on utilizing the sludge as a soil additive.

Definitions of solid waste commonly used by the solid waste management industry are the groups established by the California State Water Resources Control Board as described on the following page. The Board classifies these wastes in three groups - Group 1, 2, and 3 - on the basis of the ability of the waste to significantly impair usable waters. Group 1 waste consists of materials with toxic substances that could have the most adverse effect. The solid waste of concern in this report is classified as Group 2 and 3. These are the wastes that do not include toxic substances nor those capable of significantly impairing the quality of usable waters. Group 2 wastes - basically household refuse, rubbish, construction and demolition rubble, street refuse, and sewage treatment residue - are chemically or biologically decomposable materials that are generally collected in residential, commercial, and some industrial areas. Group 3 wastes consist entirely of non-water-soluble, non-decomposable inert solids which include concrete, plaster, brick and masonry, dirt and gravels from construction operations, grit, rock, asphalt, inert plastics, and similar materials.

Closely related to the waste groups are the classifications of waste disposal sites, including sanitary landfills, which are also established by the California State Water Resources Control Board. Sites are designated as Class I, II, or III in relation to the waste group the site is permitted to accept. Class I disposal sites provide complete protection for the quality of ground and surface waters and public health and wildlife resources for all time from the waste deposited therein. These sites are designated as capable of accepting Groups 1, 2, and 3 wastes. Class II-1 and Class II-2 provide protection to ground and surface waters and public health and wildlife resources from Groups 2 and 3 wastes. Class III sites protect water quality from Group 3 wastes. A complete description of these classifications is shown on the following page.

LANDFILL WASTES GROUPINGS

GROUP 1 WASTES

Group 1 wastes consist of or contain toxic substances and substances which could significantly impair the quality of usable waters. Examples include but are not limited to the following:

(a) Municipal origin
  (1) Saline fluids from water or waste treatment processes
  (2) Community incinerator ashes
  (3) Toxic chemical toilet waste
(b) Industrial origin
  (1) Brines from food processing, oil well production, water treatment, industrial processes and geothermal plants
  (2) Toxic and hazardous fluids such as cleaning fluids, petroleum fractions, acids, alkalies, phenols, and spent washing fluids.
  (3) Substances from which toxic materials can leach such as ashes, chemical mixtures, and mine tailings.
  (4) Rotary drilling mud containing toxic materials
(c) Agricultural origin
  (1) Pesticides or chemical fertilizers
  (2) Discarded chemical containers
(d) Other toxic waste such as compounds of arsenic, mercury or chemical warfare agents.

GROUP 2 WASTES

Group 2 wastes consist of or contain chemically or biologically decomposable material which does not include toxic substances nor those capable of significantly impairing the quality of usable waters. Examples include but are not limited to the following:

(a) Municipal origin
  (1) Garbage from handling, preparation, processing or serving of food or food products
  (2) Rubbish such as paper, cardboard, tin cans, cloth, glass, etc.
  (3) Construction and demolition materials such as paper, cardboard, wood, metal, glass, rubber products, roofing paper, and wallpaper
  (4) Street refuse such as sweepings, dirt, leaves, catch basin cleanings, litter, yard clippings, glass, paper, wood and metals
  (5) Dead animals and portions thereof
  (6) Abandoned vehicles
  (7) Sewage treatment residue such as solids from screens and grit chambers, dewatered sludge, and septic tank pumpings
  (8) Water treatment residue such as solid organic matter collected on screens and in settling tanks
  (9) Ashes from household burning
  (10) Infectious materials and hospital or laboratory wastes authorized for disposal to land by official agencies, charged with control of plant, animal or human disease
  (11) Magnesium and other highly flammable or pyrophoric materials
  (12) Tires and rubber scrap
(b) Agricultural origin
  (1) Plant residues from the production of crops including but not limited to stalks, vines, green drops, culls, stubble, hulls, hulls, lint, seed, roots, stumps, prunings, and trimmings
  (2) Manures
  (3) Dead animals or portions thereof
  (4) Adequately cleansed pesticide containers

GROUP 3 WASTES

Group 3 consist entirely of nonwater soluble nondecomposable inert solids. Examples include but are not limited to the following:

(a) Construction and demolition wastes such as earth, rock, concrete, asphalt paving fragments, inert plastics, plasterboard, and demolition material containing minor amounts of wood and metals.

(b) Industrial wastes such as clay products, glass, inert slags, asbestos, inert tailings, and inert plastics.

Groupings as adopted by the California State Water Resources Control Board, March 2, 1972.

CLASSIFICATION OF WASTE DISPOSAL SITES

CLASS I DISPOSAL SITES

Those sites at which complete protection for the quality of ground and surface waters and public health and wildlife resources is provided for all time from waste deposited therein. These sites are designated as capable of accepting for disposal Groups 1, 2, and 3 wastes. The following criteria must be met for qualification as Class I.

(a) Geological conditions are naturally capable of preventing vertical hydraulic continuity between liquids and gases emanating from the waste in the site and usable surface or ground waters.
(b) Geological conditions are naturally capable of preventing lateral hydraulic continuity between liquids and gases emanating from wastes in the site and usable surface or ground waters, or the disposal area has been modified to achieve such capability.
(c) Underlying geological formations which contain rock fractures or fissures of questionable permeability must be permanently sealed to provide a competent barrier to the movement of liquids or gases from the disposal site.
(d) Inundation of disposal areas shall not occur until the site is closed in accordance with requirements of the regional board.
(e) Disposal areas shall not be subject to washout.
(f) Leachate and subsurface flow into the disposal area shall be contained within the site unless other disposition is made in accordance with requirements of the regional board.
(g) Sites shall not be located over zones of active faulting or where other forms of geological change would impair the competence of natural features or artificial barriers which prevent continuity with usable waters.
(h) Sites made suitable for use by man-made physical barriers shall not be located where improper operation or maintenance of such structures could permit the waste, leachate, or gases to contact usable ground or surface water.
(i) Sites which comply with a, b, c, d, e, f, g, and h but would be subject to inundation by a tide or a flood of greater than 100-year frequency may be considered by the regional board as a limited Class I disposal site.

CLASS II DISPOSAL SITES

Those sites at which protection to ground and surface waters and public health and wildlife resources is provided from Groups 2 and 3 wastes.

Class II-1 sites are those overlying usable groundwater, and natural geologic conditions are capable of preventing hydraulic continuity between liquids or gases and usable water, or the disposal site has been modified to achieve such capability.

Class II-2 sites are those having hydraulic continuity with usable ground water but geologic and hydraulic feautres assure protection of water quality. Such features might include soil type, artificial barriers, or sufficient depth of ground water.

The following criteria must be met for qualification as Class II.

(a) Disposal areas shall be protected by natural or artificial features so as to assure protection from any washout and from inundation which could occur as a result of tides of floods having a predicted frequency of once in 100 years.
(b) Surface drainage from tributary areas shall not contact Group 2 wastes in the site during disposal operations and for the active life of the site.
(c) Gases and leachate emanating from waste in the site shall not unreasonably affect ground water during the active life of the site.
(d) Subsurface flow into the site and the depth at which water soluble materials are placed shall be controlled during the construction and operation of the site to minimize leachate production and assure that the Group 2 waste material will be above the highest anticipated elevation of the capillary fringe of the ground water. Discharge from the site shall be subject to waste discharge requirements.

CLASS III DISPOSAL SITES

Those sites at which protection to water quality is provided from Group 3 wastes by location, construction, and operation which prevent erosion of deposited material.

Classification as adopted by the California State Water Resources Control Board, March 2, 1972.

Source: Subchapter 15 of the Administrative Code of the State of California adopted March 2, 1972

Waste Generation

At the present time, approximately 1.1 million tons of municipal/industrial waste are generated in Alameda County annually. Over 600,000 tons of this total are disposed of in Oakland Scavenger Company landfills located at Davis Street in San Leandro and at the Durham Road site in Fremont. The Company's fleet of 250 route trucks collects approximately 450,000 tons of this waste. The remaining portion is hauled directly to these sites by other licensed haulers, construction contractors, utility companies, local residents, and others.

In recent years, the daily per capita solid waste generation rate has been increasing on the average of 1 percent per year. As shown in Table 2, the County Planning Department estimates a current daily per capita rate of 5.10 pounds and projects this estimate to a daily per capita rate of 5.36 pounds in 1980 and 5.92 pounds in 1990. Using a 1 percent annual generation rate, Oakland Scavenger Company has forecast a 6.52 pounds per capita daily solid waste generation rate by the year 2000.

Although the concept of source reduction presents hope for reducing these generation rates, estimates of the effect of source reduction are vague and uncertain, and have not been included here.

TABLE 2
ESTIMATED ANNUAL TONNAGE SOLID WASTE GENERATED FOR COLLECTION,
ALAMEDA COUNTY
BY PLANNING UNIT

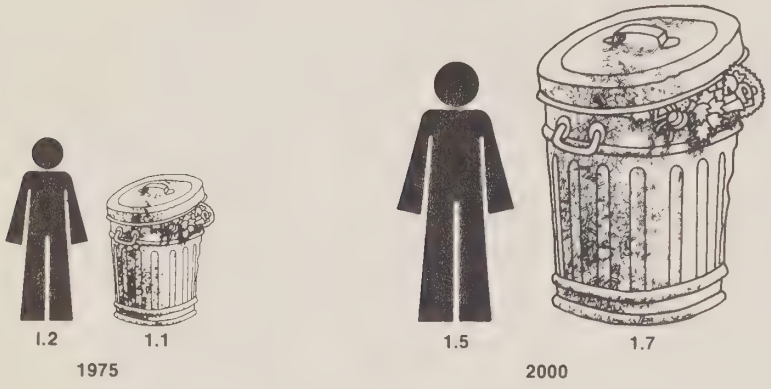
PLANNING UNIT	1973[1]	1975[1]	1980[1]	1990[1]	2000[2]
Central Metropolitan	530,000	544,000	579,000	649,000	726,000
Eden	259,000	265,000	290,000	337,000	391,000
Washington	166,000	177,000	202,000	228,000	390,000
Livermore-Amador	91,000	97,000	118,000	170,000	232,000
County Total	1,048,000	1,083,000	1.189,000	1,445,000	1,738,000
Generation Rate Lbs/capita/day[1]	5.0	5.10	5.36	5.92	6.52[2]

1. Alameda County Planning Staff and Alternatives Subcommittee of the Alameda County Solid Waste Management Plan Technical Advisory Committee. Solid Waste Management Alternatives for Alameda County. Draft. November 1974. p. 56. Based on Alameda County "B" series population projections Figures rounded.

2. Oakland Scavenger Company.

The solid waste generation projections include the portion of San Ramon that receives service from the Oakland Scavenger Company.

PROJECTED 25-YEAR POPULATION GROWTH AND SOLID WASTE GENERATION



POPULATION IN MILLIONS
SOLID WASTE IN MILLION TONS PER YEAR

FIGURE 4

When the generation rates are applied to population estimates shown in Table 1, a continuing increase of solid waste volume for the entire county is forecast to reach almost 1 1/2 million tons a year by 1990 and almost 1 3/4 million tons a year by the year 2000. Figure 4 shows how the projected county solid waste generation increase compares with the 25-year population forecasts.

The Central Metropolitan and Eden Planning Units are expected to continue to produce the greatest volumes of waste - approximately 70 to 75 percent of the county total. On a daily basis (5 days per week), these two units are now estimated to be generating 3100 tons a day of solid waste. This volume is expected to increase to 3300 tons a day in 1980, 3800 tons a day in 1990, and over 4200 tons a day by the year 2000.

DISPOSAL PRACTICES

Historical

Until recently, solid waste management in Alameda County has been relatively uncomplicated. Storage, collection, and disposal were conducted simply and economically. In 1918, when Oakland Scavenger Company was organized, collectors used horses and wagons, and waste was routinely disposed of in convenient bayside or inland dump sites. Low-lying lands along the fringe of San Francisco Bay became major depositories for such waste. These lands were convenient and inexpensive, and could be used as reclaimed land after filling was completed. Sometimes wastes were first incinerated, or often burned after dumping. For a period before World War II, waste was dumped at sea from barges operating from the Adeline Street pier in Oakland.

For many years, rags, bottles, corrugated paper, and salvageable metals were separated from refuse as it was collected. Although the percentage of salvaged materials was small, it helped reduce the disposal volume required at the landfill. This type of hand separation ended with the introduction of packer collection trucks.

Current Practices

Today new solid waste handling and disposal methods have been adopted to keep pace with the increasing volume of solid waste. A planned management system is required to move the 1.1 million tons generated each year in Alameda County from source to final disposal. Private industry and municipalities alike accomplish door-to-door collections with sophisticated packer trucks costing as much as $55,000 each. Compacting waste at collection economizes time and manpower. Customers generating large amounts of solid waste often lease storage bins which compact the waste before collection.

With the concern for conserving natural resources combined with an inflationary economy, recycling is once again emerging as part of the solid waste management process. Collection companies arrange to make special pickups for sizeable collections of recyclable paper, corrugated products, metals, glass, and aluminum. Special collections are also made for fund-raising drives. Throughout the county, environmental and ecology groups, collectives, municipal agencies, civic organizations, educational facilities, and private companies maintain recycling centers where materials may be brought by individuals and groups.

In Alameda County, municipal solid waste is currently collected by private contractors except in Berkeley and a portion of San Leandro where collection is provided by municipal crews. Generally, private contractors operate under a franchise agreement administered by the city or district with jurisdiction. Collection and disposal rates are established according to the agreement. Currently, four private contractors provide franchised municipal collection service in the county.

The largest of these is the Oakland Scavenger Company which serves approximately 75 percent of the Alameda County population through franchised agreements in Albany, Emeryville, Piedmont, Oakland, Hayward, Fremont, Newark, Union City, and Livermore. In addition, the Company provides service through contracts with the Castro Valley Sanitary District for the Castro Valley area, the Oro Lomo Sanitary District serving San Lorenzo, Ashland, and portions of San Leandro; and Valley Community Services District serving Dublin and San Ramon including a small area in Contra Costa County. Elsewhere, private contractor collection is provided by the S & R Pickup Service for a part of San Leandro, the Alameda City Disposal Company in Alameda, and the Pleasanton Garbage Service in Pleasanton. In addition, there are numerous other licensed rubbish haulers that serve these communities.

Sources

Alameda County ranks fourth in California in the volume of municipal solid waste which, by weight, accounts for 72.4 percent of all solid waste generated in the county. Of the rest of the county's solid waste, 20.9 percent is industrial and 6.7 percent is agricultural.

By comparison, the entire state, on the average, produces 32 percent municipal solid waste, 19 percent industrial waste, and 49 percent agricultural waste. The relatively high proportion of municipal waste and low proportion of agricultural waste in Alameda County reflects the county's urban character.

Potential for Resource Recovery

Only part of the municipal/industrial solid waste has any value for materials recovery or use as energy. Ongoing programs which extract significant materials from the waste stream include paper stock recovery and scrap metals processing. More diverse recovery is accomplished by community recycling centers scattered throughout the County. The remainder of the waste must currently be disposed of in landfills. Of the total amount of municipal/industrial solid waste generated in Alameda County, approximately 55 percent has no potential for material or energy recovery and requires landfill disopsal. The other 45 percent has potential for material and energy recovery.

REFUSE COMPOSITION - URBAN RESIDENTIAL AREAS

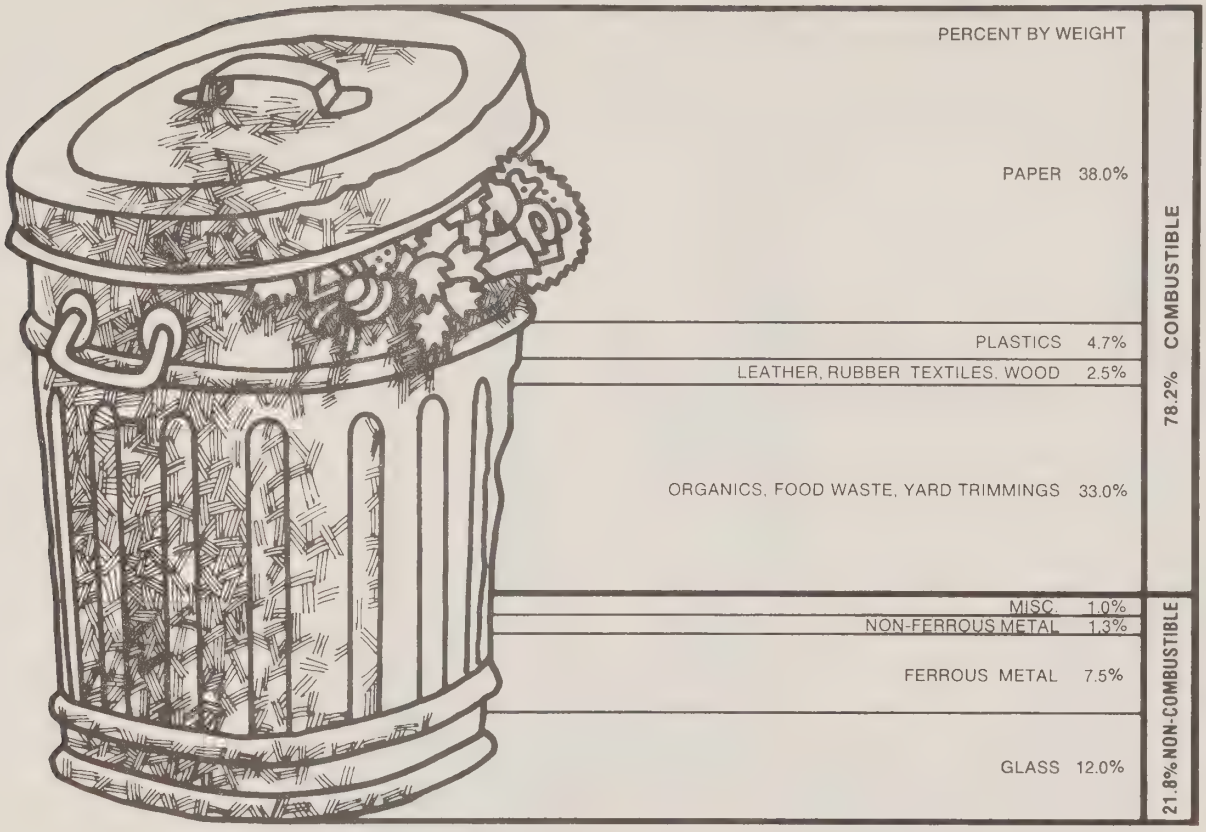


FIGURE 5

In September 1974, the Oakland Scavenger Company analyzed a sample of the 45 percent portion of the solid waste stream. Six tons of urban residential refuse collected from six East Bay routes was sorted and weighed to identify the potential for material and energy recovery. The results, as graphically illustrated in Figure 5, showed that 21.8 percent of this waste by weight consists of recoverable materials including ferrous metals, aluminum, copper, zinc, and lead, and glass. The other 78.2 percent is combustible and has potential for energy recovery. This portion consists of paper, plastics, leather, rubber, textiles, wood, organics, food, and yard trimmings.

The significance of the information from this analysis in terms of the potential for material and energy recovery in the Central Metropolitan and Eden Planning Units is shown in Figure 6. Approximately 75 percent of the County's municipal/industrial solid waste is generated in these two units. When the 45 percent recoverable and 55 percent non-recoverable ratio noted earlier is applied to the volume generated in these two units (i.e., to the 75 percent figure), the 34 percent recoverable and 41 percent non-recoverable amounts noted in Figure 6 result.

SOLID WASTE DISPOSAL REQUIREMENTS AND POTENTIAL FOR RESOURCE RECOVERY

CENTRAL METROPOLITAN AND EDEN PLANNING UNITS

34% URBAN RESIDENTIAL REFUSE (SEE FIG. 5) TO RESOURCE RECOVERY

41% DIRECTLY TO TRANSFER VEHICLE

5% RECOVERED MATERIALS METAL, GLASS, ETC.

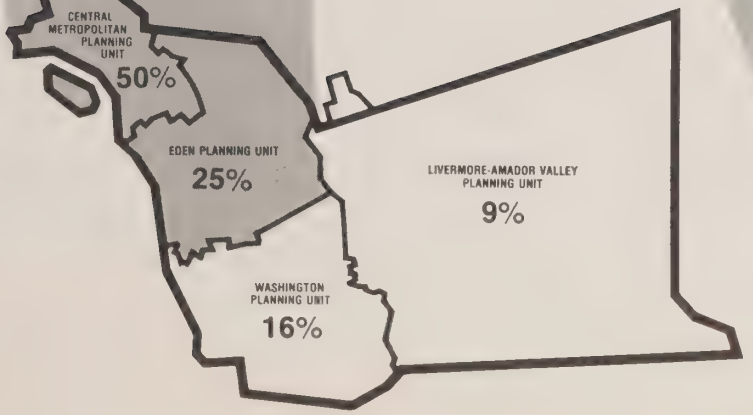
75%

29%

29% FUTURE ENERGY RECOVERY

RECOVERED ENERGY

2% RESIDUE



TO LANDFILL

LANDFILL	
WITHOUT MATERIAL RECOVERY	75%
WITH MATERIAL RECOVERY	70%
WITH ENERGY RECOVERY	43%

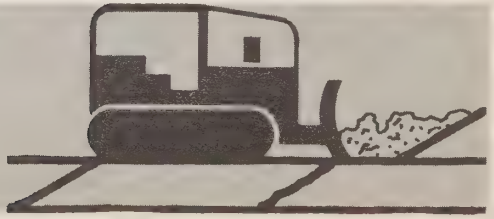


FIGURE 6

This means that approximately 41 percent of the County's solid waste that has no potential for resource recovery origninates in these two planning units and must be disposed of by landfill. The remaining amount, 34 percent which has potential resource recovery value, whill yeild approximately 5 percent of recovered materials, such as metals and glass, with the remaining 29 percent bound for landfill until such time as energy recovery becomes feasible. (The 5 percent of recovered materials figure represents approximately 70-80% efficiency in the recovery process.)

Thus, when we analyze the waste from the Central Metropolitan and Eden planning units in the context of County-wide solid waste generation, we see that the waste requiring landfill from these units alone amounts to:

75%	Without material recovery
70%	With material recovery
43%	With energy recovery

A similar analysis could be applied to the solid waste generated in the Eden and Livermore-Amador Valley planning units, but has not been done here since the Company proposes no change in the present service to their customers in these areas, and no other program for processing significant tonnages of waste through resource or energy recovery is known of in these areas. At present all waste (with the minor exception of material recovery proposed at the Pleasanton Transfer Station) within these units is landfilled.

Sanitary landfills are an integral part of the solid waste management process even with the most complete recovery presently foreseen.

SANITARY LANDFILLS, ALAMEDA COUNTY

In 1970, 11 sanitary landfills were accepting solid waste for disposal. Today only eight of these sites are in operation. By 1980, all but three of these sites will be closed. Of the landfills that are closing, the seven that are located in the Central Metropolitan and Eden Planning Units where 75 percent of the county's solid waste is produced will be filled by 1980. Information regarding all of these landfills is contained in Table 3 and the site locations are designated in Figure 7.

The Hayward site (Winton Avenue) closed in November 1974 and the Alameda Naval Air Station disposal site also closed that year. Most recently, in March 1975, the Albany landfill was required to cease operations under Court order as a result of a suit initiated by the State Lands Commission. With the closing of these sites more than 265,000 tons of solid waste a year are being diverted to other fills. A portion of the waste originally intended for Albany's site is being sent to the Berkeley landfill. Waste planned for disposal in the Hayward site is now hauled to the Davis Street site, which is also receiving the waste from the Alameda Naval Air Station. Such diversions hasten the time when remaining landfills will be completed. The sites that are now in operation are shown in Figure 7.

TABLE 3
SANITARY LANDFILL SITES
ALAMEDA COUNTY

CLOSING DATE	SITE AND PLANNING UNIT	OWNER/OPERATOR	TYPE OF WASTE	ANNUAL 1973 TONNAGE	CUMULATIVE ANNUAL TONNAGE (Basis 1973
Closed	Hayward Disposal Site (E) (West Winton Avenue)	Oakland Scavenger Company	Group 2	145,000	
Closed	Alameda Naval Air Station Disposal Site (CM)	Military	Group 2/3	40,000	
Closed	Albany Landfill (CM)	City/Albany Landfill Corp.	Group 3	80,000 265,000	265,000
1976	Marina Disposal Site (E)	San Leandro/Turk Island Co.	Group 3	40,000	
1977	Alameda City Disposal Site (CM)	City/Alameda City Disposal Co.	Group 2/3	70,000	
1977	Davis Street Disposal Site (E)	Oakland Scavenger Company/ Oakland Scavenger Company	Group 2	380,000	
1977	Pleasanton Public Dump (L-A)	Pleasanton Garbage Service, Inc.	Group 2	20,000 510,000	775,000
1980	Berkeley Landfill (CM)	City/Berkeley Landfill Company	Group 2	120,000	
1982	Turk Island Disposal Site (W)	Turk Island Co./Turk Island Co.	Group 2/3 (except garbage)	15,000 135,000	910,000
1995	Eastern Alameda County Disposal Site (Vasco Road) (L-A)	Ralph Properties, Inc./ De Paoli Equipment, Inc.	Group 2	50,000	
2000	Fremont Disposal Site (Durham Road) (W)	Oakland Scavenger Company/ East Bay Disposal Co.	Group 2	110,000 160,000	1,070,000

PLANNING UNITS

(CM) Central Metropolitan (E) Eden (W) Washington (L-A) Livermore Amador Valley


1970 SANITARY LANDFILLS
ALBANY LANDFILL
BERKELEY LANDFILL
ALAMEDA NAVAL AIR STATION LANDFILL
ALAMEDA LANDFILL
DAVIS STREET LANDFILL
MARINA LANDFILL
HAYWARD LANDFILL
TURK ISLAND LANDFILL
FREMONT LANDFILL
EASTERN ALAMEDA COUNTY LANDFILL
PLEASANTON LANDFILL
24
580
50
680
17


1975 SANITARY LANDFILLS
BERKELEY LANDFILL
ALAMEDA LANDFILL
DAVIS STREET LANDFILL
MARINA LANDFILL
TURK ISLAND LANDFILL
FREMONT LANDFILL
EASTERN ALAMEDA COUNTY LANDFILL
PLEASANTON LANDFILL
24
580
50
680
17

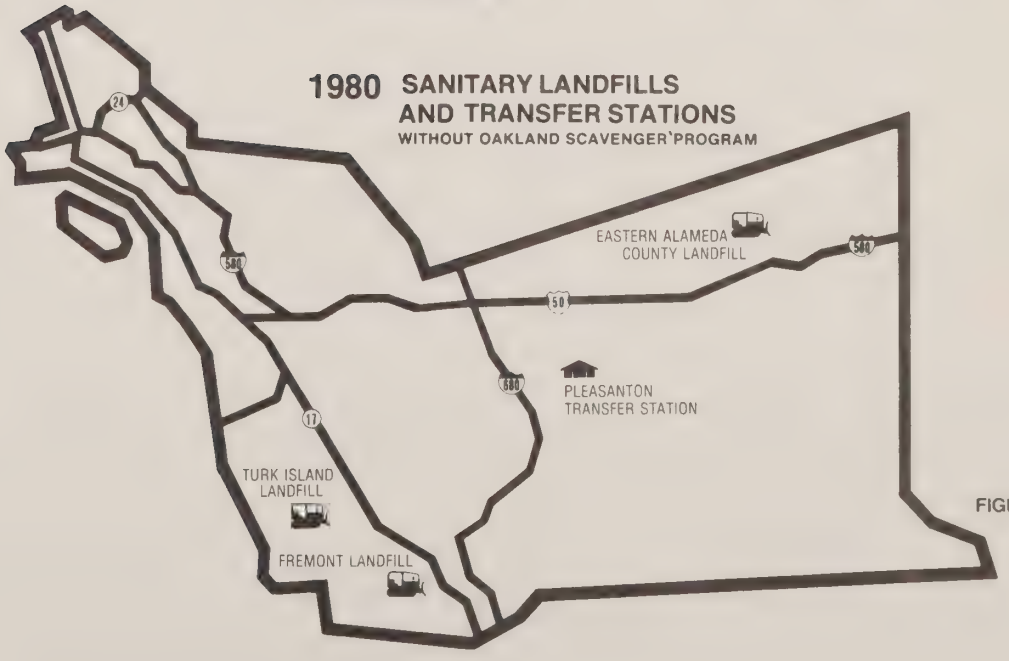

1980 SANITARY LANDFILLS AND TRANSFER STATIONS
WITHOUT OAKLAND SCAVENGER PROGRAM
TURK ISLAND LANDFILL
FREMONT LANDFILL
EASTERN ALAMEDA COUNTY LANDFILL
PLEASANTON TRANSFER STATION
24
580
50
680
17

FIGURE 7

By 1977, four more sites are scheduled to close -- the Pleasanton landfill, the City of Alameda disposal site, and both the Marina and Davis Street disposal sites in San Leandro. The closing of these sites will require facilities to handle an additional 510,000 tons of waste a year, or - including sites already closed - a cumulative total of 775,000 tons. Of this amount, it is expected that the 20,000 tons handled by the Pleasanton Garbage Service, Inc. will go to the Eastern Alameda County disposal site after the Pleasanton landfill closes and the Pleasanton transfer station is constructed.

In 1980, the Berkeley landfill is scheduled to close. As a result of accepting waste originally designated for the Albany fill, the site may be completed before that time. As noted later in this section, the City of Berkeley is planning to undertake a future disposal solution for its solid waste. If plans are delayed or abandoned, an additional 120,000 tons of solid waste would require disposal facilities temporarily or on a long-term basis. Figure 7 designates the landfills that are expected to be operating in 1980 after the Berkeley landfill closes.

Subsequently, in the early 1980's, the Turk Island site in Union City is slated for completion. This site now accepts 15,000 tons of waste annually.

The two remaining sites - the Fremont (Durham Road) and the Eastern Alameda County disposal sites shown in Figure 7 are expected to have available capacity until approximately the year 2000. The Fremont site is limited by use permit to receiving only waste which originates within the City Limits of Fremont, Newark, and Union City. While the Eastern Alameda County disposal site has capacity until the year 2000 at its present rate of fill, the addition of wastes from other sites as they close will reduce its life proportionately.

OTHER SOLID WASTE MANAGEMENT PROPOSALS IN ALAMEDA COUNTY

Throughout the Bay Area, efforts to improve the disposal situation are generally concentrating on reducing the amount of waste going to landfill sites and developing new technology to improve disposal methods. In Alameda County, projects that have been under recent discussion include:

The Bay Delta Resource Recovery Project

Commonly known as the Bay Delta Plan, this proposed demonstration project evolved from the 1971 Report of the San Francisco Planning and Urban Renewal Association (SPUR). Now sponsored by the Association of Bay Area Governments (ABAG) through the Bay Delta Resource Recovery Action Committee, this project proposes using municipal refuse to raise the level of the San Joaquin-Sacramento Delta islands. Refuse would be brought to a transfer station to be built in Berkeley and to the San Francisco Solid Waste Transfer Station and processed to remove ferrous metals. The light organic fraction would be composted with sewage sludge and barged to the Delta. Funding of $6.2 million for a test program is being sought from the State and Federal governments. The City of Berkeley has been instrumental in the development of this project and considers it as a long-range solution for disposal of that community's solid waste.

Kaiser Radum Pits Proposal

The Kaiser Sand and Gravel Company has proposed using solid waste to reclaim the Kaiser-Radum gravel pits resulting from a 775-acre sand and gravel mining operation north of the City of Pleasanton. It was expected that as much as 3500 tons a day of solid waste would be transported by truck or railroad from East Bay Cities. This proposal was approved by the Regional Water Quality Control Board in March 1973 as a Class II landfill. Subsequently, Citizens Against Garbage Environment (CAGE) appealed to the State Water Resources Control Board which rejected the earlier approval of the Regional Water Quality Control Board. The State Board's ruling was appealed to the Alameda County Superior Court which set aside the State Board's decision. A new hearing before the State Board is scheduled for the Summer of 1975 at which time the Board is expected to affirm or set aside its earlier decision.

Pleasanton Transfer Station

In Pleasanton, a small transfer station has been proposed to transfer solid wastes when the Pleasanton landfill closes in 1976. Wastes originally intended for the landfill would be transferred and hauled to the Eastern Alameda County (Vasco Road) Disposal site.

RELATED GOVERNMENTAL ACTIONS

As the volume of solid waste grows and society becomes more conscious of energy supplies and shortage of natural resources, all levels of government are increasingly involved in solid waste management.

In 1965, the Federal Government recognized the problems of solid waste when Congress enacted the Solid Waste Disposal Act of 1965. This Act, which was later amended by the Resource Recovery Act of 1970, provided grants to the states to help finance statewide solid waste management planning activities. Under the impetus of this Act, the California Department of Health appraised the status of solid waste management in the state. The department's report issued in 1968 verified the need for coordinated planning and adequate financing of solid waste management programs.

Spurred by this report, the Governor established a Task Force on Solid Waste Management in April 1969 to evaluate conditions and to recommend a course of action for the state. In a report submitted in January 1970, the Task Force recommended a state policy to require master plans for solid waste management facilities for counties or multi-county regional authorities.

Subsequently, the State Legislature enacted Senate Bill 5, the Solid Waste Management and Resource Recovery Act of 1972. This law charged local government with primary responsibility for providing adequate solid waste management and planning and the State with responsibility for developing and maintaining policy, setting minimum standards, and developing a Solid Waste Resource Recovery Program.

Further, the Act established the State Solid Waste Management Board, consisting of seven voting members and three nonvoting members, to carry out these responsibilities. The membership of the Board is specifically designated to include representatives from local government and private enterprise as well as individuals with expertise in the field. The Act also established within the Board a 25-member advisory council, appointed by the Governor to represent the various interests involved in solid waste management. This council will terminate on July 1, 1976.

The most significant provision of the Solid Waste Management and Resource Recovery Act of 1972 is the requirement for each county or region, in cooperation with other affected local jurisdictions, to prepare a comprehensive, coordinated solid waste management plan. This plan must be approved by a majority of the cities which contain a majority of the population of the incorporated area of the county. The plan, which must be feasible, efficient, and economically practical, must be submitted to the California State Solid Waste Management Advisory Board by January 1, 1976. In Alameda County, the Solid Waste Board by January 1, 1976. In Alameda County, the Solid Waste Management Advisory Committee is preparing a plan for the county which will be submitted to the Board later this year. The Oakland Scavenger Company program is designed to respond not only to the immediate needs for waste collection and disposal, but also to the spirit of Master Planning now underway in Alameda County.

PROPOSED SOLID WASTE MANAGEMENT PROGRAM

4

PROPOSED SOLID WASTE MANAGEMENT PROGRAM

OBJECTIVE

The proposed solid waste management program is a solution for handling increasing amounts of solid waste generated in the Central Metropolitan and Eden Planning Units as landfills in these units close in the next few years. The proposed program is a comprehensive system to serve the customers of Oakland Scavenger Company over the long term to well beyond the year 2000. Moreover, the flexibility of the system will enable the Company to provide collection and disposal services to other communities within Alameda County wherever they may be needed in the future. The program includes all phases of solid waste management: collection, resource recovery, transfer, and final disposal. The most modern equipment and methods that have proven reliable, economic, and safe will be used. At the same time, the system will be flexible enough to accept new technology, particularly in materials and energy recovery. The system is designed to handle solid waste efficiently while meeting applicable environmental standards.

ELEMENTS OF THE PROGRAM

The facilities of the program proposed by the Oakland Scavenger Company are shown in Figure 8. The specific elements are:

- San Leandro resource recovery/transfer station
- A fleet of high-capacity, long-haul transfer vehicles
- Altamont sanitary landfill in eastern Alameda County
- Material recovery operations at the San Leandro facility
- Future resource recovery/transfer station with ferrous metal recovery processes located in the Hayward area
- Future energy recovery at the San Leandro facility.

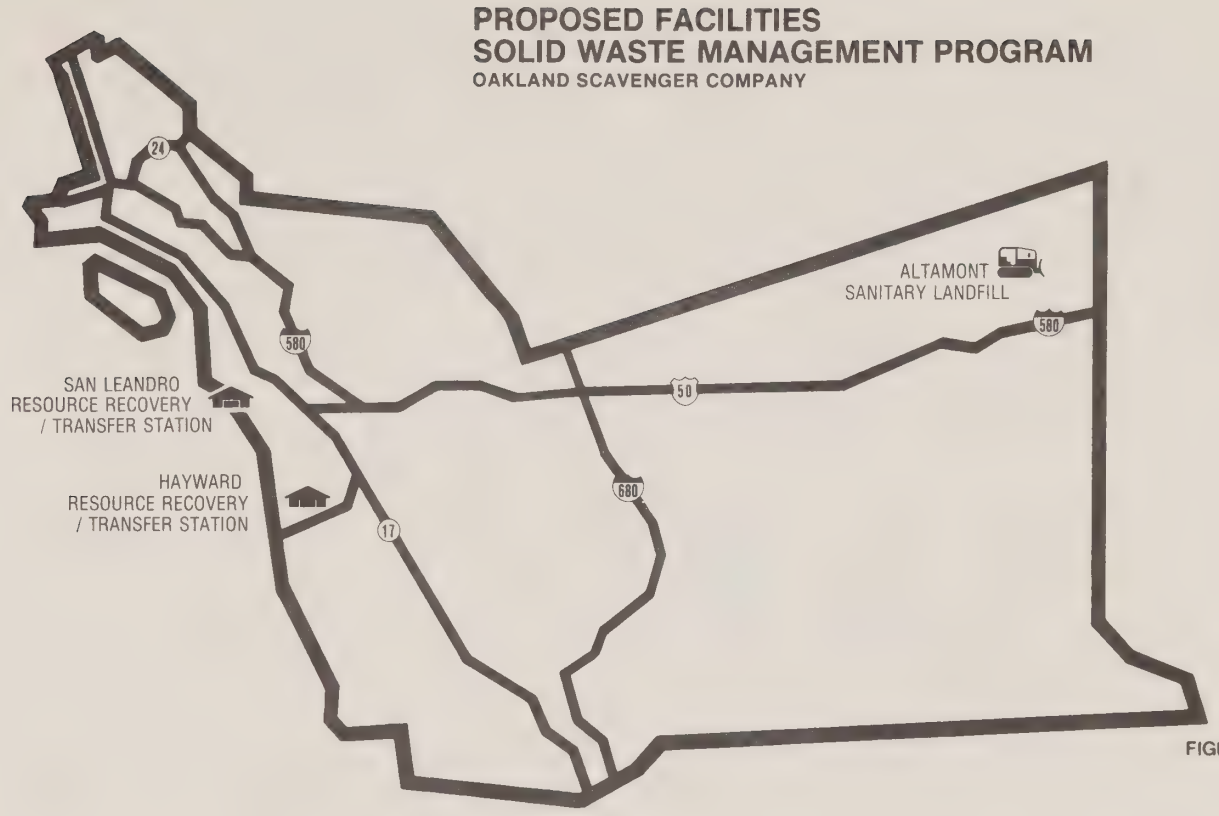


FIGURE 8

When the facilities proposed by the Company are combined with other solid waste management facilities which are expected to be operating in Alameda County in 1980 and which were shown earlier on Figure 7, the results are shown below in Figure 9.

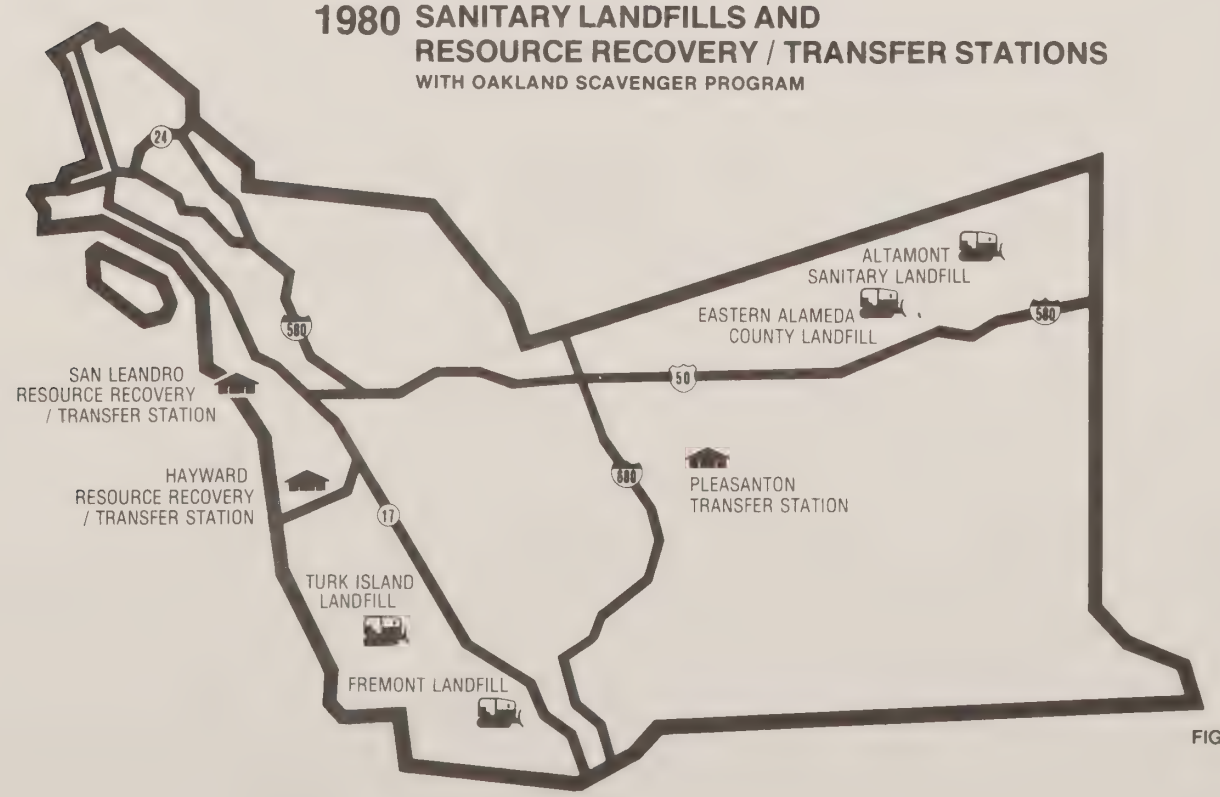


FIGURE 9

SAN LEANDRO RESOURCE RECOVERY/TRANSFER STATION

The San Leandro facility is the major part of the proposed program to handle solid waste from the communities of the Central Metropolitan and Eden Planning Units: Albany, Berkeley, Emeryville, Oakland, Piedmont, Alameda, San Leandro, Hayward, San Lorenzo, Ashland, and Castro Valley.

Solid waste from these communities has been disposed of at landfill sites that will be closed by 1980. With the San Leandro facility, municipal/industrial solid waste generated in these communities can be transferred to a new site located at a greater distance than the landfills that are now being used.

Although nearby sites for new landfills would be most economical in terms of hauling costs, soaring property prices, the absence of suitable sites, and controls on Bay fill have contributed to the necessity of finding acceptable sites in undeveloped areas. For hauls beyond 20 miles one-way, and especially for service areas with more than 100,000 population, it is more economical to transfer wastes into large transfer vehicles than to haul directly to a distant landfill in collection vehicles. Such transfer operations have been initiated at San Francisco, Seattle, Los Angeles, Detroit, Chicago, and other major metropolitan areas.

Many factors influenced the selection of the Davis Street site as the location for the resource recovery/transfer station. At the present time it is the site of a landfill operation which is scheduled to be completed in 1977. Using a small portion of this completed site for transfer and resource recovery activities, and designating the major portion for commercial recreation development improves the use of the property. Moreover, resource recovery/transfer station activities are compatible with industrial activities on adjoining and nearby property. The site is located at the end of a major industrial thoroughfare which is already traveled by heavy trucks. For East Bay communities most affected by imminent and future landfill closing, the site is centrally located with convenient access from the Nimitz Freeway via the Davis Street interchange. Since the property is already owned by the Oakland Scavenger Company, land acquisition will not be necessary.

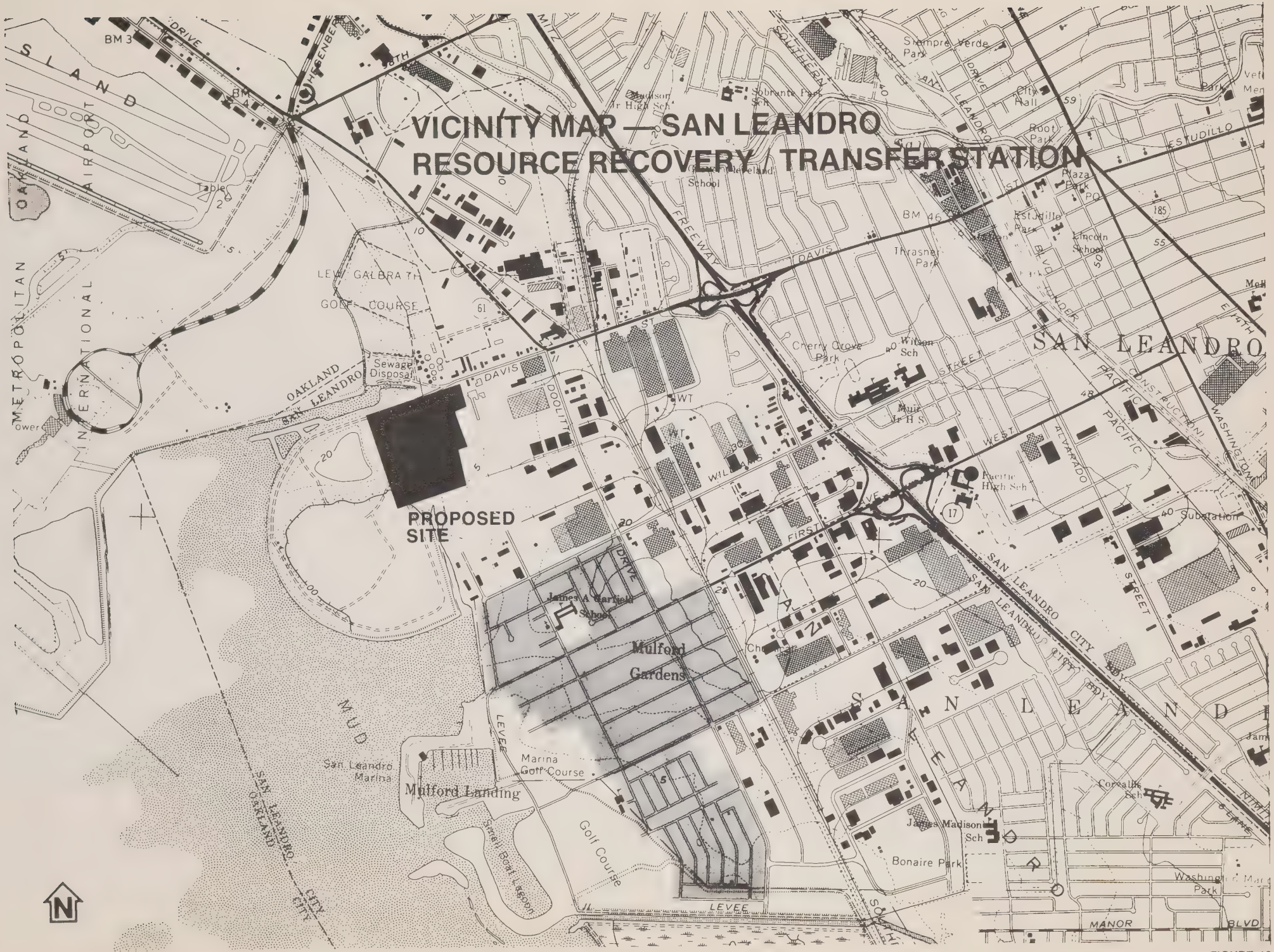

VICINITY MAP — SAN LEANDRO
RESOURCE RECOVERY / TRANSFER STATION
PROPOSED SITE
OAKLAND INTERNATIONAL AIRPORT
METROPOLITAN
SAN LEANDRO
Mulford Gardens
Mulford Landing
San Leandro Marina
Marina Golf Course
Golf Course
LEVEE
MUD
Sewage Disposal
James A Garfield School
Muir Jr H S
Pacific High Sch
Lincoln School
Wilson Sch
Thrasher Park
Bonaire Park
James Madison Sch
Coronado Sch
Washington Park
Substation
FREEWAY
DAVIS
WEST
FIRST
PACIFIC
MANOR
BLVD
N

FIGURE 10

The Site

The San Leandro resource recovery/transfer facility will occupy approximately 53 acres of the 247-acre property now owned by the Oakland Scavenger Company. As shown in Figure 10, the property is a semi-circular shape jutting into the Bay at the foot of Davis Street in San Leandro. Land area totals 233 acres, with the remaining 14 acres under water. It was diked in 1942 and has since been developed as a landfill. At the present time, over 10,000 tons of solid waste are received here each week from a population of 550,000 in Albany, Piedmont, Emeryville, Oakland, San Leandro, Hayward, San Lorenzo, Ashland, and Castro Valley. The Bay Cities Paper Stock Company recycling operation is located on the property and a metal salvage operation is conducted on the landfill in cooperation with Los Angeles By-Products Company which shreds household waste and magnetically extracts approximately 100 tons of ferrous metal, or tin, cans a week.

The site is located about three quarters of a mile west of the Nimitz Freeway, Route 17, and approximately a third of a mile west of Doolittle Drive. Access is provided along Davis Street with an interchange at the freeway. The Metropolitan Oakland International Airport lies directly northwest of the site across a brief span of Bay waters. A slough along the southeastern side of the property separates it from the Southern Pacific Transportation (SPTC) industrial tract. The Hohener Meat Company, Inc., a slaughterhouse and meat packing company, adjoins the site to the east. Directly north of the site across Davis Street is the San Leandro sewage treatment plant. To the southeast, the closest residences of Mulford Gardens and Marina Faire are approximately 3000 feet from the proposed resource recovery/transfer station.

The 247 acres owned by the Oakland Scavenger Company is within the jurisdiction of the City of San Leandro. The property is now zoned X which provides for limited uses, primarily reclamation landfill. Rezoning by the City will be required and is discussed in the section on implementation.

Operations

At the San Leandro facility, waste from many collection trucks and private vehicles will be transferred to high-capacity, long-haul transfer trucks. Vehicles will be weighed first, and tare and gross weights, time, date and disposal fees will be recorded at the entrance scales. At the tipping floor, self-unloading trucks will tip their loads into the receiving pit. Route trucks with household refuse will unload on one side. Other trucks with inert debris and other non-recoverable materials will be directed to the other side of the tipping floor to keep household refuse with recoverable materials separate from the non-recoverable materials. At the public dis-

PRELIMINARY SITE PLAN SAN LEANDRO FACILITY

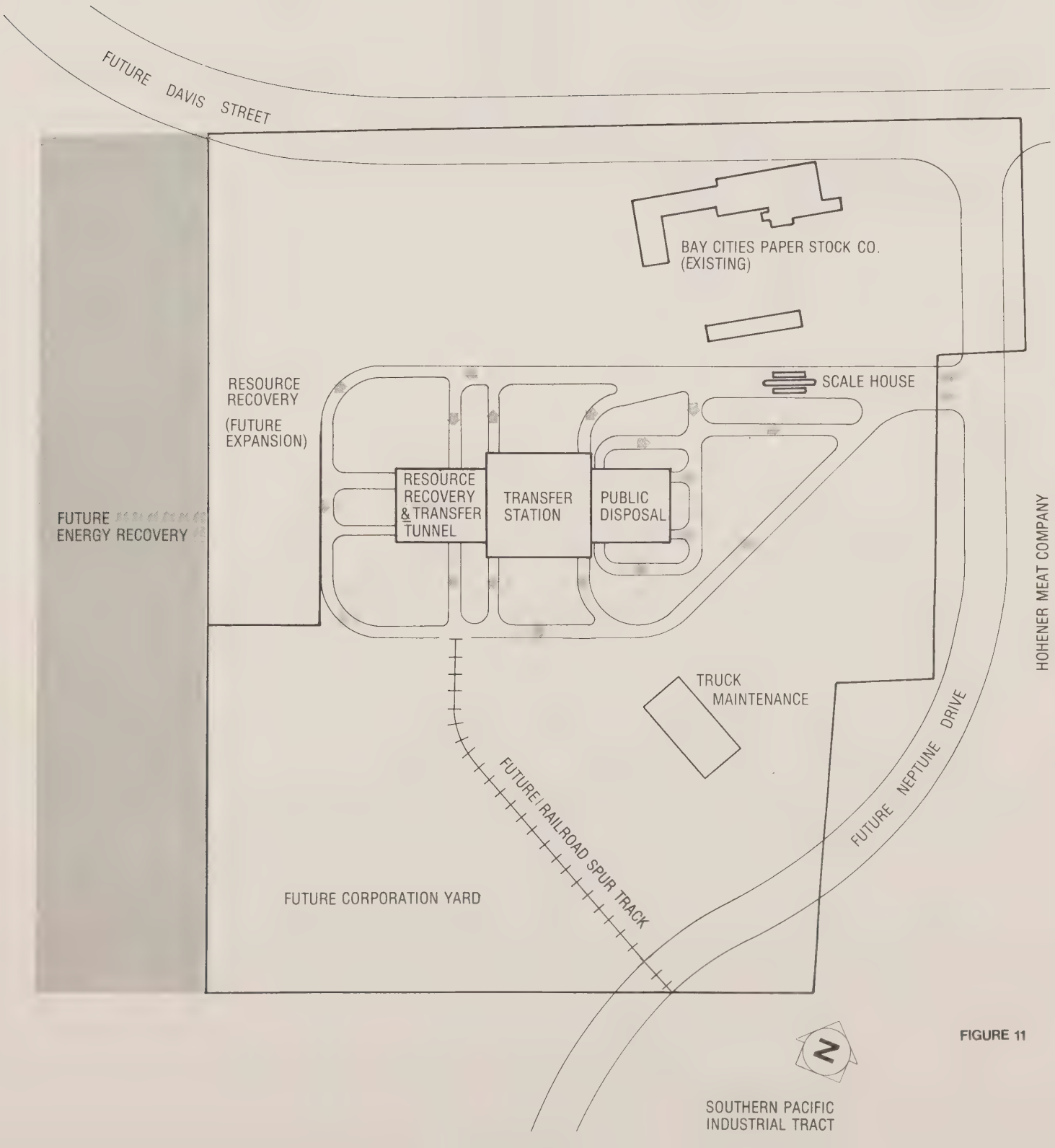


FIGURE 11

SAN LEANDRO RESOURCE RECOVERY / TRANSFER STATION

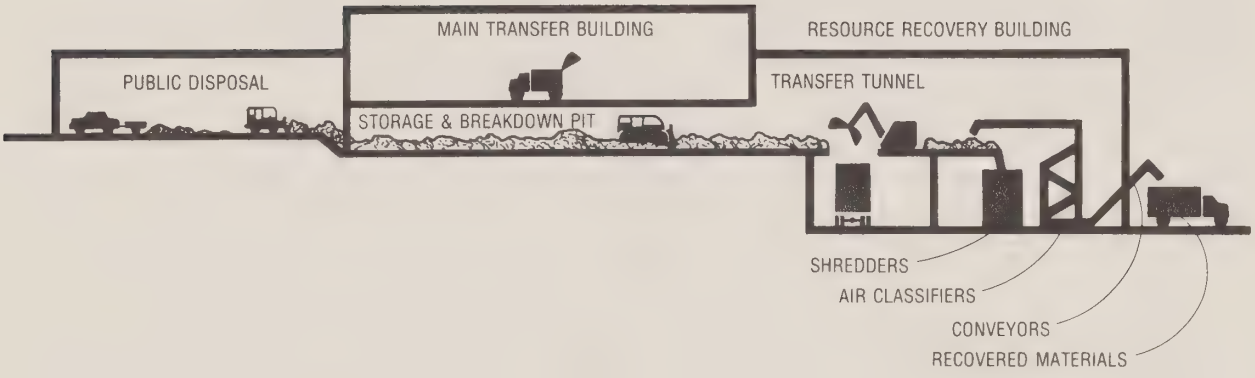


FIGURE 12

posal area, residential and commercial customers will be able to unload their own refuse. Public waste will be dumped onto a flat concrete floor, then moved by front end loader into the main receiving pit. The preliminary site plan (Figure 11) shows the arrangement of buildings and activity areas. Figure 12 is a sectional view of the station showing how different floor levels will be used to handle the waste from incoming vehicles to outgoing transfer trucks.

As refuse reaches the pit, two bulldozers will crush it and smash large bulky items, then push it forward to openings in the pit floor where the waste falls into the transfer trucks. Two clamshells will be used to top off refuse in the trucks to assure conformance with the legal California highway load limit. When resource recovery operations begin, household waste will be moved by conveyors ~~from the pit~~ to the materials processing areas. Until then, household and demolition refuse alike will be loaded onto transfer trucks for the trip to the Altamont landfill site.

The facility will be open to the public and commercial haulers during the same hours as the hours of the landfill now operating on the site.

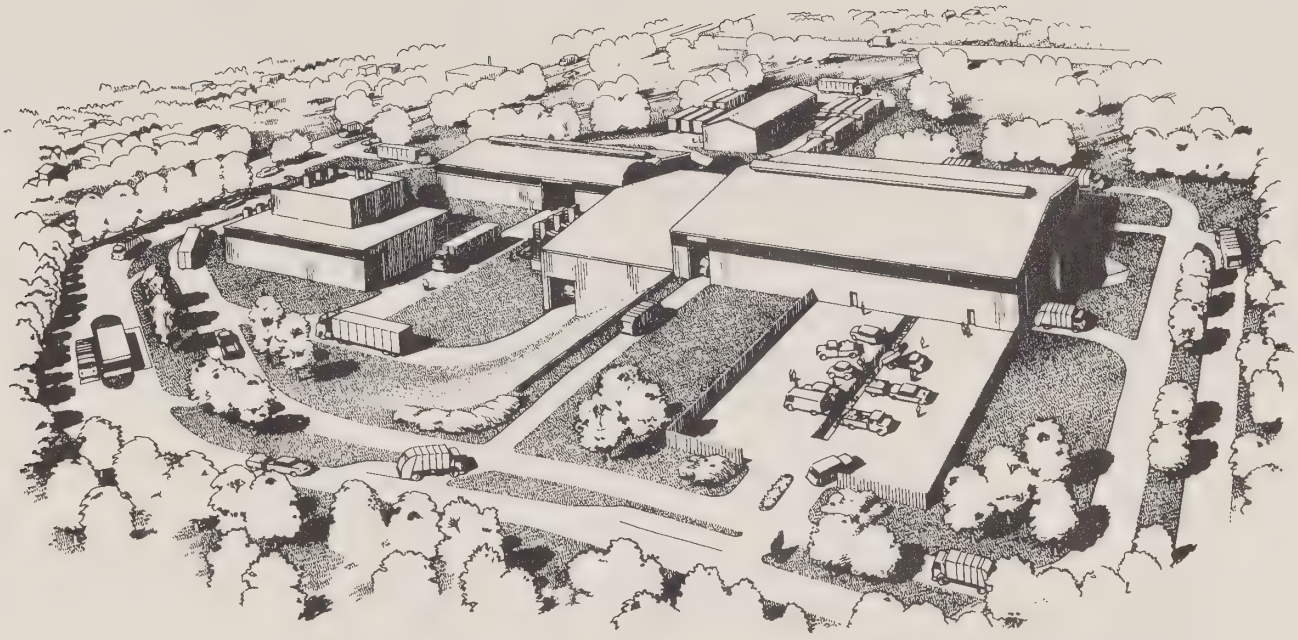
Architecture and Engineering

The resource recovery/transfer station will be designed as a cluster of modern industrial buildings with a square central section and a wing at each end at lower elevations than the main building. All transfer activities including collection truck dumping, public disposal, transfer truck loading, and resource recovery will take place within completely enclosed buildings. The proposed building arrangement is shown in Figure 11. The central section (approximately 40,000 square feet) will house the refuse pit flanked on both sides by tipping floors. The public disposal area will be housed in a building (approximately 21,000 square feet) at one end of the receiving pit. At the opposite end of the main building, a building (approximately 24,500 square feet) will house the transfer truck loading bays and the future material recovery facilities. Office space for administrative work, and rest rooms are included. A truck maintenance shop for washing, fueling, and servicing vehicles is located a short distance from the transfer building.

The overall height of the building will be governed by the depth below the existing solid waste fill and groundwater level that the lowest part of the building can be safely and economically constructed. For aesthetic reasons, and to minimize the amount of earth fill required for foundations and access ramps, this height will be kept to a minimum.

The building will be sheathed with attractive colored siding and the site will be graded and landscaped to assure an attractive facility compatible with surrounding activities and with the community's general goal of creating an attractive waterfront area.

The foundation of the buildings will be designed to overcome the problems of building over the old landfill. Preliminary soils analysis indicate that the landfill varies in thickness from 18 to 27 feet and is underlain by Bay Mud and clays that are typical of tidal areas around the Bay. The clays under the soft Bay Mud are sufficiently stiff to provide a satisfactory foundation. Studies are underway to determine the most feasible method of constructing foundations. Options include removing the refuse fill and replacing it to the required levels with a compacted earth fill, or leaving the refuse in place and supporting the buildings on pilings.



Shown above is an artist's rendering of the resource recovery/transfer station that was done very early in the planning process to demonstrate the concepts of the program. Several features have changed significantly from this early rendering, such as the location of buildings and traffic circulation around them, and the public disposal area, which is now enclosed within a building. Despite these changes, the rendering shows the general architectural appearance of the main transfer station building, and is included here for that purpose.

Capacity

The transfer station has been designed to handle the daily (5 days per week) solid waste volumes projected for the Central Metropolitan and Eden Planning Units. The projections for these planning units show a daily average tonnage of approximately 3300 tons in 1980, 3800 tons by 1990, and 4200 tons by 2000.

The station's receiving pit is a surge pit capable of accepting and efficiently handling varying amounts of refuse to a maximum of approximately 5000 tons a day. Approximately 95 percent of municipal/industrial solid waste is collected in a five-day period with the greatest tonnage collected on Monday. The average tonnage represents a value between extremes of light flow periods and surge periods. Amounts received could vary considerably within any 24-hour period, and from day to day. The pit is designed to accommodate solid waste during peak periods of peak days.

Traffic and Circulation

Current Traffic

Traffic was a major consideration in the selection of Davis Street as the site for the proposed resource recovery/transfer station. Davis Street is designated as a local truck route in the San Leandro General Plan and it is a major route for heavy industrial traffic in the west San Leandro area. Approximately one third of a mile east of the site, Davis Street crosses Doolittle Drive which extends from the residential area south of the site northwest of the Oakland Airport. All traffic bound for the landfill now operated on the site uses Davis Street west of Doolittle Drive and most traffic uses Davis Street east of Doolittle Drive. Traffic to and from the landfill on Davis Street west of Doolittle Drive averages approximately 750 vehicles daily with truck traffic heaviest on weekdays and private vehicle traffic heaviest on weekends.

Proposed Improvements

The City of San Leandro has long sought to eliminate the frequent congestion at the Southern Pacific Transportation Company (SPTC) railroad crossing of Davis Street. Since part of Davis Street is a State Highway, the State Department of Transportation has assumed responsibility for obtaining Public Utilities Commission approval for, and ultimately constructing, an overcrossing. The construction of this improvement appears to be several years in the future.

Other street changes at the western end of David Street are shown on the General Plan of the City of San Leandro. Neptune Drive, which now passes northwesterly by the San Leandro Marina, has been planned as a bayside scenic thoroughfare. It would be extended north from its present terminus near Williams Street in the SPTC industrial tract to intersect Davis Street near the sewage treatment plant. Davis Street would be widened and extended over a short stretch of Bay waters northwest to Airport Drive in the City of Oakland.

San Leandro Facility Circulation

As shown in Figure 11, ultimate access will be from the future improved Neptune Drive. Interim access to the facility will be from Davis Street. All incoming traffic will be weighed at the scale house and will then proceed to the designated unloading area. Vehicles to be unloaded by hand will turn into the public disposal area. Self-unloading trucks will ascend the ramp to the tipping floor in the main building. Transfer trucks will drive to the loading tunnel and descend to be loaded. All vehicles will exit on the same one-way drive which completes the loop. This traffic pattern eliminates traffic conflicts and minimizes the mixing of public traffic with Company and commerical vehicles within the site.

San Leandro Facility Traffic

Certain traffic increases can be reliably predicted when the San Leandro facility begins operations. Traffic now using the landfill will use the transfer station. Additional traffic will be generated by:

- Twenty-five to thirty long-haul transfer trucks which will operate between the transfer station and the landfill. The number of trips each day will vary with the volume of waste received. As an example,on the basis of 1980 solid waste generation projections, if 15,000 tons a week of solid waste are received at the facility, approximately 109 truck trips per day, 6 days a week would be required to transport the waste. If waste is transferred to the landfill 5 days a week, approximately 130 truck trips a day would be required. As the volume of waste handled by the station increases, the number of transfer truck trips will gradually increase. Transfer truck traffic will be scheduled to minimize conflicts with peak hour commute traffic.
- The commute trips of approximately 35 employees and truck drivers.

Other traffic increases resulting from the facility are difficult to estimate. These increases will be due to additional employees as resource recovery reaches full operation and the possible shift of traffic to this site as other landfills close. Oakland Scavenger Company has undertaken an actual count of the number and type of vehicles entering other landfill sites to determine what effect this traffic could have on the San Leandro facility as other sites close and waste is sent to the San Leandro facility. This data will be analyzed by a traffic consultant and discussed fully in the Environmental Impact Report on the project.

Safety

On-site fire extinguishing equipment will include a fire protection sprinkler system as well as the hoses used for washing the tipping floor and the sprinkler used for dust control.

Fire fighting services will be provided by the City of San Leandro Fire Department which maintains two stations in the general area: one station on Marina Boulevard near Doolittle Drive and the other station on Davis Street east of the Nimitz Freeway.

City of San Leandro Police Department will provide police protection. The site will be fenced and the gate locked during non-operational hours. Nighttime security personnel will be provided by the Oakland Scavenger Company.

Utilities

Water

Water will be obtained from the Eastbay Municipal Utility District System. The site is now served by an 8-inch main on Davis Street, at the northeast corner of the site. This main is expected to be adequate for transfer and resource recovery activities. Another 8-inch main along Neptune Drive is available for extension to the Davis Street main when Neptune Drive is extended.

Sewerage

Sanitary sewer services will be obtained from the City of San Leandro. Lines with adequate capacity will be installed from the station to the sewage treatment plant on Davis Street opposite the site.

Storm Drainage

Storm drainage for all surface runoff will be provided in accordance with the requirements of the San Leandro Department of Public Works. Outflows for storm waters are readily available to the slough and Bay.

Energy

Electric service is available from PG&E. Initially the need for electricity will be nominal, about 400 horsepower to be used mainly for lighting and ventilation. Later, resource recovery operations will require as much as 4000 horsepower. Resource recovery electrical requirements will be included in planning for the site. As a result of gradual increase in the demand for power in the San Leandro industrial area, PG&E has formulated plans to improve service. Included in these plans will be provision for serving the long-range needs of the Oakland Scavenger Company at this site. Adequate power for the transfer station and resource recovery operations is expected to be available when needed.

Natural gas may be required for space heating. PG&E distribution service is available in Davis Street.

Communications

Telephone service will be obtained from the Pacific Telephone Company.

Other Considerations

Noise

The acoustic environment of the site is now dominated by the activity at the Oakland Airport, but daytime noise is also produced on the site by the landfill equipment, the outdoor ferrous metal recovery operations, and collection trucks.

Three types of noise will be generated by the San Leandro facility. One, which is temporary, will be construction noise. Other noise will be produced by equipment operating within the buildings and by vehicles using the facility. Most of these noises will be confined to daytime hours. Since all transfer operations will be conducted within the transfer building, the enclosing building and foundation walls will help to reduce operational noise and ambient noise levels. Noise levels will also decrease in volume with distance from the facility and Davis Street. Noise that is already generated by the landfill and outdoor metal recovery operations will cease when those activies end. Further information regarding the noise environment will be presented in the Environmental Impact Report.

Air Quality

Dust and odor from the site are concerns that have already been expressed by the community. Completely enclosing the operation is the first and most important step in controlling dust and odor. Dust control within the building will rely on a sprinkler system designed to reduce dust created by dumping into the pit. The Environmental Impact Report will contain an analysis describing current air quality at the site and nearby areas, the potential effect of the transfer station on air quality, and the measures that will be adopted to eliminate dust and odor.

Odors will be controlled by good housekeeping practices such as washing down the tipping floors and collecting loose debris, and also by proper management of the transfer process including minimizing the time that waste stays in the pit, using equipment properly, and maintaining equipment to avoid breakdowns.

TRANSFER VEHICLE FIGURE 13

TRANSPORT

Vehicles

For the long haul between the San Leandro facility and the Altamont landfill, Oakland Scavenger Company will use 25 to 30 trucks with trailer units designed for solid waste. These units, as shown in Figure 13, are high-capacity, loose-volume bulk transfer vehicles. Similar units are in operation in Los Angeles, Seattle, and Reno. The lightness of their aluminum bodies provides a capability of payloads ranging from 23 to 24 tons. The trailer units are 50 feet in length and have a carrying capacity of 130 cubic yards. The overall length of the truck and trailer units is 60 feet. Each unit will be self-unloading with a built-in conveyor-type moving floor which does not require additional unloading equipment at the landfill. In this way, equipment investment and maintenance costs are reduced. Wire mesh covers will be used to prevent materials from blowing out or spilling during the trip. The units conform to the California Vehicle Code and highway regulations.

The Route

The transfer vehicles, each with the contents of approximately four to five collection trucks, will travel the 33-mile trip to the Altamont landfill in approximately 50 minutes. The route will follow Davis Street east approximately three quarters of a mile to the Nimitz Freeway, then south on the Nimitz and east along Route 238 and Interstate 580 to old Altamont Pass Road which leads three miles to the site. The return trip will use the same route and will take about 45 minutes.

Alternate Transport Equipment and Methods

For the volume of waste and hauling distance involved in the proposed program, long-haul trucks are the most economical and practical method of transport. In selecting the particular type of vehicle and method of transport, Oakland Scavenger Company investigated many other methods and equipment.

Other trucks

The transfer units selected by Oakland Scavenger Company provide the most economically efficient volume and tonnage carrying capacity when compared to other units. Other types of bulk loaders require additional equipment at the landfills for unloading. One uses a bulldozer with cables to pull out the waste. Carrying capacity for trucks and trailers using this operation ranges from 20 to 22 tons per vehicle. Variations of this technique are used in Los Angeles, Orange County, and Seattle. Another unit used in San Francisco requires specialized tippers at the landfill to lift the entire truck to spill the waste from the rear door.

Compaction transfer trucks, another type of transfer vehicle, compacts the waste to a smaller volume but is heavier in construction. These trucks are built with heavy reinforced steel to resist the force of the compaction ram and carry additional weight in hydraulic oil to activate the large ejection plate. They are capable of a net carrying capacity of only 16 to 19 tons compared with the 23-ton capacity of the units selected by the Oakland Scavenger Company.

High-Density Baling

A new concept for waste transport is high-density baling. In St. Paul, Minnesota, 3000-pound bales, approximately 3' X 3' X 4' are produced, then transported to the disposal site by flat bed trailer. In San Diego, similar bales, weighing about 2600 pounds are produced after a shredding process. In both cases, baling is relatively expensive and the added cost is not offset by savings in vehicle carrying capacity.

Rail

Rail haul is an alternative to the long-haul trucks that are proposed. Rail access is readily available from the Southern Pacific Transporation Company (SPTC) spur adjacent to the San Leandro facility site. The SPTC

and the Western Pacific Railroad (WPRR) have main lines through Altamont Pass adjacent to the landfill site.

Installation of a spur track into the San Leandro facility site is being studied closely and is included in the planning for the site. A spur track could serve several other purposes in addition to the potential for transporting wastes. Heavy equipment for resource recovery can be delivered more easily to the site via rail, and, ultimately, outgoing shipments of recovered materials could be transported by rail.

Rail access at the landfill would be more complicated to install. Although the property adjoins the SPTC and WPRR main lines, significant differences in elevation between the lines and the property pose considerable problems. In addition, the narrowness of the Altamont Pass limits the alternatives for unloading waste adjacent to the main line without bringing a rail spur onto the property. In each instance, some method of moving the waste from the railhead up to the fill area would be included.

The expense of solving these problems at the landfill added to the cost of building a rail spur at the San Leandro facility and building the facility for rail car loading overshadow the attractiveness of possible lower rail rates. Moreover, arrangements for acquiring or leasing rail cars are uncertain, and to guarantee daily movement of the rail cars would be beyond the Oakland Scavenger Company's control. The prospect of a waste-laden train awaiting departure or delayed en route is a concern expressed by members of the San Leandro Community.

The alternative of rail transport of waste has not been completely discarded. As the economy changes, rail haul may become a more attractive hauling method, and, at some point, justify the investment. That option will remain open.

Barge

Hauling waste by barge has also been considered. Although haul rates are low, and waste could be loaded at the Davis Street site, the Altamont landfill location is at least eight miles from the nearest off-loading point in the San Joaquin delta. A truck transport link would be required and necessitate purchasing a number of high-capacity trucks and providing truckloading and unloading facilities, labor, and related expenses. Any advantages gained in long haul rates would be lost.

Pipelines

Pipelines can be used to transport high volumes of materials from fixed point to fixed point. But long-distance pipeline transport has very limited application. The economics of the system require extremely large quantities of waste, on the order of 10,000 tons a day, almost two-and-a-half times the maximum volume of 4200 tons a day expected to be produced in the Central Metropolitan and Eden Planning Units combined by the year 2000.

ALTAMONT SANITARY LANDFILL SITE

The most important part of the Oakland Scavenger Company proposed program to accomplish the primary objective of providing continuing disposal service for residents in the Central Metropolitan and Eden Planning Units is a new sanitary landfill. Including the solid waste generated from the City of Berkeley, as much as 100 percent of the refuse generated in the Central Metropolitan and Eden Planning Units will require new landfill in the immediate future. Later, even with material recovery, a sanitary landfill will still be required to dispose of the nonrecoverable materials as well as the residuals from the recovery process.

Application will be made to Alameda County for approval of a Class II-1 landfill capable of receiving and safely disposing of Groups 2 and 3 waste in the Altamont Hills. Approval of site classification lies primarily with the State Water Resources Control Board and the Central Valley Regional Water Quality Control Board.

A sanitary landfill is a method of waste disposal on land based on sound engineering principles and construction methods. Waste is confined to the smallest practical area, compacted to the lowest possible volume, and covered with a layer of earth at the end of each day's operation. Landfills are generally acknowledged to be the safest method of refuse disposal. Properly located and engineered landfills can safely dispose of materials while protecting the environment and public health. They are also the least costly method of disposal available.

Recently, as concern for conserving resources and recovering materials has intensified, landfills have come under serious attack. While it is now possible to recover more resources than have been salvaged in the past, landfills are still needed to dispose of the major portion of municipal/industrial solid waste.

The Site

The Altamont landfill site proposed as part of the solid waste management program is located in an isolated area of eastern Alameda County in the Altamont Hills approximately eight miles east of Livermore, as shown in Figure 14. It is a 1600-acre site on Altamont Pass Road off Interstate 580 relatively isolated from public view or contact. The site and surrounding area are grass-covered rolling hills which vary in elevation from 1260 feet at the highest point to 500 feet in the low valleys to the east. At the present time it is agricultural land used for cattle grazing.

FIGURE 14

Figures 14 and 15 show the locations of some of the major man-made features near the site. Old Altamont Pass Road and the railroad lines of the Southern Pacific Transportation Company and Western Pacific Railroad lie near the southern boundary of the site. Dyer Road is approximately one mile west of the property with the South Bay Aqueduct adjacent to the east side of this road. The California Aqueduct and the Delta-Mendota Canal are approximately one-and-a-half to three miles east of the site. Interstate Route 580 passes through the Altamont Hills one to one-and-a-half miles to the south. Other than the ranch residences in the property, the nearest residences are located at Altamont Pass and on adjoining property to the west and along Dyer Road.

Capacity

A preliminary estimate indicates that this site could provide disposal space for 50 years or more depending on the development of resource recovery facilities. When filling operations begin in 1977, it is expected that the site will handle over 755,000 tons of Group 2 waste annually. When the Berkeley landfill closes, the amount of waste could reach as high as 875,000 tons.

BETHANY RESERVOIR

ALTAMONT LANDFILL SITE

FIGURE 15

SANITARY LANDFILL OPERATION

FIGURE 16

Operations

In a sanitary landfill operation, waste is unloaded from the transfer truck, or other vehicle, at the base of the working face, the inclined surface on which this waste is spread and compacted by bulldozer, as illustrated in Figure 16. The face, which may vary in length from 100 to 200 feet, rises about 20 to 25 feet on an approximate three to one slope (horizontal to vertical ratio). The earth used for a cover layer at the end of each day's operations will be obtained from excavation on the site. Bulldozers and scrapers will be used to excavate and place the earth cover.

Although filling will ultimately take place over much of the site, the actual filling operations at any one time are generally confined to 100 acres or less. Agricultural uses will continue over the remainder of the site.

Filling will typically be done in the canyons. An earth buttress will be placed at the bottom or toe at the point in the canyon where the fill will begin. The filling process will work up the canyon, raising the fill height uniformly and creating a fill face. When the fill is complete to final elevations the fill will have a two-foot-thick final covering of earth and be returned to agricultural use. The operation will move to the next canyon area. In this manner, the site will gradually be filled to final elevations as approved by the County.

Public disposal will also be permitted. A scale and small office building will be situated at the entrance for weighing all but the smallest loads. Operations normally will be conducted during daytime hours. Wind is a dominant condition in the Altamont area and will require provisions to minimize potential litter and dust problems. Movable fences will be used in the immediate fill area to control paper and litter, and dust will be controlled by sprinkling.

Traffic and Circulation

Since construction of I-580 to the south, Altamont Pass Road traffic levels have decreased considerably to low levels. Operation of the landfill at the site will increase traffic along this route and require an access road to be contructed for access into the site. Traffic generated by the site will include transfer trucks and other commercial and private vehicles using the site. Traffice projections and a traffic analysis are being made and will be submitted to the County for inclusion in the environmental impact report to be written on the project.

Equipment

The equipment needed at the landfill will include bulldozers, scrapers to move dirt, landfill compactors, a motorgrader to grade roads, and water trucks to control dust on the access road. The transfer trucks are self-unloading and will not require additional equipment.

A small office, probably with 200 square feet of space, will be located on the site as well as an equipment maintenance shop.

Fire Protection

Under California legislation adopted in 1970, open burning of solid waste at disposal sites has been prohibited since January 1, 1972. If a fire occurs, it can be effectively smothered with dirt which will be maintained near the working face. A water supply will also be provided on the property.

Additional fire-fighting protection, if required, is available from the Alameda County Fire Patrol located in Livermore at 1617 College Avenue at P Street, and the California State Division of Forestry under mutual aid agreement.

Security

A barbed wire fence now encloses the site. When operations begin, a front gate that can be locked after operating hours will be provided and an attendant will reside on the property. The site is within the jurisdiction of the Alameda County Sheriff's office which would respond if required.

Geologic and Groundwater Conditions

Results of preliminary geologic investigations show the property to be well suited to use as a landfill site. The bedrock mainly consists of shale with minor amounts of sandstone, has low permeability, and does not contain significant amounts of groundwater. The bedrock is covered by a clay topsoil which also has low permeability. There appears to be adequate potential for the development of earth cover from the shale bedrock and from the clay topsoil. The few low-yield domestic and stock watering wells in the region produce groundwater that is of fair quality and, in most respects, meets the drinking water standards of the U. S. Public Health Service, but exceeds mandatory upper limits for several important constituents.

A geologic and soil investigation undertaken by Woodward-Clyde Consultants, of Oakland, has been completed. The scope included: Aerial photographic interpretation and geologic mapping of the site, a well canbass, surface water and groundwater sampling; drilling and constructing observation wells, field pumping tests and field permeability tests; exploratory trenches and borings, soils and rock samplings, geophysical refraction survey, laboratory analysis of soil and rock samples, engineering analyses and interpretation of field and laboratory findings; and the preparation of a formal soil engineering and geologic report.

Biologic Environment

Ecologically, landfills have a minimal effect on wildlife and plant life. Disruption of shelter and food for birds is temporary and these creatures return after the initial operation has begun. Because the actual landfill operation is confined to a small portion of the total site, there is still ample space for normal life of native species.

A study of the biological environment of the site is being prepared and will be included in the environmental impact report.

Archaeologic Environment

An archaeologic reconnaissance of the site has been made, and a full report will be in the environmental impact report. The few archaeological features located on the site will be considered in the filling plan.

Utilities

The landfill will require minor utility service. Approximately 10,000 gallons per day of water may be required for dust control. Purchase of that water from off the site, and transport to the site may be necessary, since wells in the area have a low yield due to the small amount of groundwater. A Pacific Telephone and Telegraph cable facility is planned to cross the site, and negotiations are underway to situate that facility to avoid fill or excavation areas.

Drainage

Although the property is entirely within Alameda County, the major portion of the site drains east to the San Joaquin Valley. A small portion of the northwest corner drains west into the Livermore Valley and Alameda Creek watershed.

Surface drainage will be diverted around areas being filled and completed fill areas will be sloped to drain toward their perimeters to minimize any infiltration of surface water into the landfill. Gravel or pipe drains will be installed before filling in those areas where springs or other water cannot be prevented from flowing beneath the landfill. Drainage down the face of the fill will be provided by collector ditches and drain pipes similar to methods used on highway construction. As fill areas are completed, erosion control will be provided by seeding grasses, and installing permanent drainage channels and structures to prevent loss of earth cover material.

Subsurface or groundwater movement is expected to be extremely slow, and confined almost entirely to the aluvium soils concentrated in the canyon bottoms. Monitoring wells will be located to permit detection of any contamination of groundwater that might occur from the fill. A means of monitoring the possible development of leachate in the landfill will also be included. This monitoring program will be described in detail and will be subject to approval by the Regional Water Quality Control Board.

Methane Gas Production

Methane gas production is a normal by-product of the decomposition process in all sanitary landfills. In well-constructed landfills the escape of gas to the atmosphere is minimal and presents no safety problem. With the tight foundation material existing at the site, lateral migration of gas is not anticipated. When these factors are considered with the remote location of the site, methane gas production is not expected to pose any problem. Methods of using this methane as a source of energy are being developed in other fills in California. As this technology develops it will be studied for application to the Altamont landfill.

MATERIALS RECOVERY

Once transfer facilities are operating, the Oakland Scavenger Company proposes to begin material recovery operations at the San Leandro facility to recover materials from the urban residential area refuse generated in the Central Metropolitan and Eden Planning Units. Initially, the operation will recover ferrous metals. Subsequently, operations will be expanded to recover nonferrous metals, which include zinc, iron, copper, brass, and lead, and later, glass.

The resource recovery operation would be housed in the wing adjoining the transfer truck loading tunnel. The engineered fill for this wing will be prepared when the station is constructed. Later, when resource recovery is initiated, the foundation will be completed, the structure extended over the foundation, and equipment added.

As it is now planned, the recovery system would be a dry process. Household waste pushed to the end of the receiving pit by bulldozers would be carried on conveyors to the recovery area. There it would be fed into high-capacity shredders which would crush and pulverize the materials into smaller (4- to 6-inch) uniformly sized particles. The shredded material would pass by a magnetized conveyor belt which would magnetically extract ferrous metals such as tin cans and other steel products. Until more extensive recovery operations are added at the station, the residuals from this process would be conveyed back to the transfer truck loading level and be loaded into the transfer trucks from the resource recovery side of the loading area. The separated ferrous metals will be discharged to a waiting truck and subsequently transported to a market for recycling. (See Figure 12).

Various techniques are available to separate nonferrous metals and glass. While it is too early at this time to specify the exact equipment to be used in this operation, it is likely that it will include air density separators, screens, two-stage magnetic separation, dense media separators and, possibly, a process for glass recovery.

The most serious obstacle confronting complete resource recovery is economics. It is too costly for solid waste collectors to maintain separate routes for source-separated materials such as paper, metals, and glass. Increasing wages combined with soaring fuel prices and maintenance costs for collection trucks make it more economical to recover materials at a central location with mechanical equipment. But to operate economically, mechanical processing requires a certain minimum volume of recyclable materials in the solid waste stream. This volume can vary seasonally. The volume also varies as individuals and groups increasingly separate and sell materials such as paper, metals, and glass. Legislation like the Mandatory Deposit Laws may have significant negative impact on resource recovery programs.

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Preliminary data indicate that the mandatory deposit system on beverage containers has resulted in a predominantly refillable bottle system. While this system has reduced roadside litter, it is too early to assess whether it will significantly reduce quantities of recoverable metal and glass in the municipal solid waste stream. Similar legislation was adopted in Vermont, and was submitted in Congress as well as the California Legislature.

At the other end of the recovery process, unpredictable markets and fluctuating prices threaten the financial feasibility of recovery programs. During the Winter of 1974, for example, some of the highest prices in Northern California history were paid for recycled paper and corrugated. By the following summer, prices had dropped to a small percentage of the winter peak. Many factors contributed to the decline. The overseas market, which originally had a considerable role in boosting the prices, vanished. In the United States, the housing industry, a major market for gypsum and wall board which are manufactured with recycled corrugated, was drastically curtailed by the pressures of inflation and recession. Markets for these materials withered, and collectors were caught with unwanted supplies. It was a dramatic illustration of the effects of unreliable markets and prices.

Adding to the costs of many recycled materials are freight rates that are higher for recycled materials than rates for competing virgin materials. For example, rail rates for scrap iron, glass cullet, and reclaimed rubber, and ocean rates for wastepaper are higher than the rates for equivalent new products.

Material recovery operations at the San Leandro facility depend primarily on the availability of funds for plant construction and equipment, the dependability of markets and prices for recovered materials, and on contractual agreements which guarantee satisfactory markets for recovered materials. Preliminary estimates indicate that $3.6 million will be required for construction alone. Further investigation and continued monitoring of technology now being tested across the country is also needed before making a final selection of recovery equipment to assure reliability and effectiveness.

ENERGY RECOVERY

As part of the solid waste management program, investigations are being conducted with Pacific Gas and Electric (PG&E) and East Bay Municipal Utility District (EBMUD) to study the feasibility of constructing a solid waste energy conversion facility in the East Bay. It is estimated that as much as 5 to 10 percent of East Bay residential energy needs could be supplied by using solid waste as fuel.

If findings of these studies support the investment in energy recovery, an energy conversion system could be added to the San Leandro facility. Preliminary plans allocate 17 acres adjacent to the west side of the station next to materials recovery operations for energy recovery. Residuals from materials recovery, obtained through "front end" processing, would be conveyed to energy recovery for "back end" conversion. The waste used in this process would amount to 29 percent of all the County's solid waste (Figure 6). When examined as a part of one category of the County's solid waste - urban residential area refuse generated in the Central Metropolitan and Eden Planning Units (Figure 5) - the percentage consumed in energy increases to 78.2 percent.

Two basic types of energy can be produced in conversion precesses. One type of energy is a transportable fuel. While this kind of energy can be stored on site or moved elsewhere, some energy is required to transport it from one area to another. The other type of energy is the on-site production of steam for heating or generation of power-electricity.

Preliminary studies by PG&E indicate that nearly $45 million would be necessary to construct facilities to convert 1750 tons per day of solid waste to energy. Because of the high cost and untried technology, the Oakland Scavenger program does not include specific plans to construct an energy recovery facility at this time. However, the program considers energy recovery to have strong potential for future implementation, and, if current studies prove fruitful, the Oakland Scavenger Company will support development of an energy recovery facility.

COST ESTIMATES

Construction of the Davis Street transfer station, purchase and development of the Altamont landfill, and purchase of the transfer vehicles will require an estimated $7.0 million. Another $3.6 million will be required for resource recovery operations at the Davis Street station. In addition, the Hayward Area tranfer station is estimated at $2.7 million with metal recovery operations at that station requiring another $1 million. Total estimated cost for the full program is expected to exceed $14 million.

These estimates, based on 1975 dollars, include the necessary architectural and engineering services, the preparation of environmental studies, necessary environmental impact reports, permits and inspections, construction, land acquisition where necessary, and equipment and machinery.

This program is to be fully financed by the Oakland Scavenger Company, without the need for voter approved bond issues or increased tax revenues. Several financing alternatives are currently understudy by the Company.

TABLE 4 - COST ESTIMATES
(Million Dollars)

DESCRIPTION	TOTAL	CUMULATIVE TOTAL
Altamont Landfill Purchase, Development and Equipment	2.1	2.1
Davis Street Transfer Station and Equipment	3.1	5.2
Transfer Truck Purchase and Maintenance Shop	1.8	7.0
Davis Street Resource Recovery	3.6	10.6
Hayward Area Tranfer Station	2.7	13.3
Hayward Area Resource Recovery	1.0	14.3

IMPLEMENTATION

5

IMPLEMENTATION

PUBLIC AGENCY PROCESSING

Certain administrative steps must be taken in order for this program to be implemented. Separate processing and approvals are required for the San Leandro resource recovery/transfer station and the Altamont sanitary landfill site. The application for the San Leandro facility will be processed through the City of San Leandro and will require the City Council's final approval. For the landfill, the approval of the Alameda County Planning Commission and Board of Supervisors must be obtained. The State Water Resources Control Board and the Central Valley Regional Water Quality Control Board, the agencies responsible for maintaining water quality standards in the Central Valley area, must approve site classification and establish waste discharge requirements. The entire Oakland Scavenger Company program must be certified by Alameda County and the State Solid Waste Management Board to be in accordance with the Solid Waste Management Plan to be adopted for Alameda County.

San Leandro Resource Recovery/Transfer Station

The sites for the San Leandro resource recovery/transfer station and potential energy recovery operation are part of 247 acres owned by the Oakland Scavenger Company. This entire property is presently zoned X which allows limited uses, primarily reclamation landfill. The portion of the property to be used for the resource recovery/ transfer station (53 acres) will require rezoning from X to I-2, an industrial classification. The area allocated for potential energy recovery facilities (17 acres) will remain in X zoning until energy recovery facilities are developed. The remaining area (177 acres) is proposed for rezoning to C-R (Commercial Recreation) consistent with most of the San Leandro waterfront.

A General Plan amendment is required to reflect the proposed zoning changes from X to I-2 and C-R districts. An environmental impact report must be prepared for the rezoning and the General Plan amendment, as well as a separate environmental impact report prepared for the resource recovery/transfer station construction.

Operation and maintenance of the San Leandro resource recovery/transfer station are regulated by ordinance and/or permits to assure that the facility complies with health and safety regulations and standards. The station will be operated in accordance with the regulation of applicable agencies. Approval/certification and review is required from various agencies including: The City of San Leandro, Alameda County, San Francisco Bay Region Water Quality Control Board, Bay Area Air Pollution Control District (BAAPCD), the State Department of Public Health,

the State Solid Waste Management Board, the Environmental Protection Agency (EPA), Association of Bay Area Governments (ABAG), the Califonia Department of Fish and Game, the Bay Conservation and Development Commission (BCDC), the Corps of Engineers, and the Cities and Districts served by the Oakland Scavenger Company.

Altamont Sanitary Landfill Site

The property proposed for the landfill site is entirely owned by the Oakland Scavenger Company. It is now zoned for agricultural use, and is also designated an agricultural preserve under California's Williamson Act. A conditional use permit from the County will be required for the landfill. Neither rezoning nor an amendment to the General Plan will be required.

The Project Report and application for the landfill will be submitted to the Alameda County Planning Department. The Planning Department will review the application, prepare the Environmental Impact Report, and submit their recommendations to the County Planning Commission. After the Commission has acted, the application will be referred to the County Board of Supervisors and then to the State Solid Waste Management Board for approval.

Agencies which must approve or establish requirements for or review the landfill include Alameda County, Central Valley Regional Water Quality Control Board, Bay Area Air Pollution Control Board (BAAPCD), State Solid Waste Management Board, the Alameda County Fire Patrol, the Department of Water Resources, Department of Fish and Game, Environmental Protection Agency (EPA), Association of Bay Area Governments (ABAG), the State Division of Forestry, and the Cities and Districts served by the Oakland Scavenger Company.

DEVELOPMENT SCHEDULE

Once the necessary approvals have been obtained and permits issued, development of the resource recovery/transfer station and landfill can commence. In order to assure continuing solid waste disposal services for Oakland Scavenger Company's customers, the San Leandro facility must receive the necessary approvals and permits by the end of 1975 and construction must begin in early 1976. The facility is to be ready for operation by early 1977. The transfer truck maintenance shop and fleet of transfer vehicles would also be ready in 1977. On this schedule, the Altamont landfill must be ready to receive waste by early 1977.

Once these operations are underway, attention and effort can be focused on detailed planning and engineering for the San Leandro material recovery program. The need for a Hayward area resource recovery/transfer station can be assessed at that time using up-dated projections for future population and municipal solid waste generation.

PUBLIC INFORMATION AND PARTICIPATION

Public information and participation is considered an integral part of this program.

In the Fall of 1974, the Oakland Scavenger Company presented a slide program at the San Leandro Community Seminars. The Company has since shown this program to numerous community groups and will continue to do so, upon request to their offices at 2601 Peralta Street, Oakland.

The ideas and view points of interested groups and individuals are invited throughout the planning and permit review process. Public hearings will be required and there will be many opportunities on all approval levels for people to comment on the program.

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